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# GREAT INTERNATIONAL FISHERIES EXHIBITION, 1883.

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**LONDON, 1883,**

*UNDER STATE RECOGNITION.*

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J. W. MAY, K.N.L., Consul-General Jorckken.

Hon.-Consul JAN VAN DRUNEN.

Vice-Consul H. I. J. MAAS.

A. E., MAAS, Esq. *Member of the Netherlands Sea-fisheries Board.*

Baron P. F. van HEERDT, *Secretary to the Netherlands Sea-fisheries Board.*

Professor A. A. W. HUBRECHT, *Secretary to the Netherlands Sea-fisheries Board.*

**NEW ZEALAND.**

Sir F. D. BELL, K.C.M.G., Agent-General, 7 Westminster Chambers, S.W

**NEWFOUNDLAND.**

Hon. AMBROSE SHEA, *Commissioner.*

LIST OF SPECIAL COMMISSIONERS—*continued.*

**RUSSIA.**

Mons. N. DE SOLSKY, 10 Quai de la Fontanka, St. Petersburg.

**SPAIN.**

ROYAL SPANISH NAVAL COMMISSION, 57 Gracechurch Stree
*Commissioner.*
EDWARDO YEVES, Esq., 24 Fenchurch Street, E.C.

**STRAITS SETTLEMENTS.**

Hon. CECIL C. SMITH, Colonial Secretary, Singapore.
Hon. J. SWINBURNE BOND.
Hon. A. CURRIE.
Dr. DENNYS.
Hon. J. GRAHAM.
W. A. PICKERING, Esq.
F. A. SWETTENHAM, Esq.

**SWEDEN.**

Professor F. A. SMITT, *Royal Commissioner.*
OSCAR DICKSON, Esq., *Commissioner.*
Dr. MOBERS, *Superintendent in charge of Exhibits.*

**TASMANIA.**

HENRY BUTLER, Esq., *Chairman*, Public Buildings, Hobart.

**VENEZUELA.**

El Senor Don RAFAEL SEIJAS, Foreign Secretary, Caracas.

**ZANZIBAR.**

S. B. MILES, Esq., H.M. Acting Agent and Consul-General, Zanzibar

# CLASSIFICATION.

| Exhibitors to quote the Number in this Column. | |
|---|---|
| | **CLASS I. FISHING.** |
| | *SECTION I.* **SEA FISHING.** |
| Div. 1 | ..... 1. GEAR OF EVERY DESCRIPTION AND OF ALL NATIONS USED IN TRAWL, HERRING, LONG LINE, HAND LINE, AND EVERY OTHER MODE OR SYSTEM OF FISHING, INCLUDING ALL NETS, LINES, HOOKS, HARPOONS, TACKLE, &C., EMPLOYED IN THE SAME. |
| Div. 2 | ..... 2. OYSTER DREDGES, CRAB, LOBSTER, PRAWN, &C., POTS, AND OTHER APPLIANCES FOR CATCHING FISH OF THIS DESCRIPTION. |
| | 3. FISHING CRAFT OF ALL NATIONS; MODELS AND REPRESENTATIONS OF THE SAME. |
| Div. 3 | ..... (i.) Steam Fishing Vessels and Steam Carriers. |
| Div. 4 | ..... (ii.) Fishing Vessels and Boats other than Steam Vessels. |
| Div. 5 | ..... 4. ROPES AND CANVAS SUITABLE TO FISHING VESSELS. |
| Div. 6 | ..... 5. STEAM AND HAND CAPSTANS, COMPASSES, BAROMETERS, TELESCOPES, LIGHTS, LAMPS, FOG HORNS, SYSTEMS OF SIGNALLING AT NIGHT FOR FISHING FLEETS AND VESSELS, ELECTRIC LIGHTS, LUMINOUS PAINT, AND OTHER EQUIPMENT OF FISHING VESSELS, CHARTS FOR FISHERMEN. |
| Div. 7 | ..... 6. MODELS OF HARBOURS, PIERS AND SLIPS, FOR FISHING PURPOSES. |
| Div. 8 | ..... 7. FISHING TACKLE AND NETTING IN DIFFERENT STAGES OF PREPARATION, AND MACHINERY USED FOR WORKING UP THE RAW MATERIAL. |
| Div. 9 | ..... 8. LIFE BOATS, THEIR EQUIPMENT, AND LIFE-SAVING APPARATUS OF EVERY DESCRIPTION. |
| Div. 10 | ..... 9. APPLIANCES AND METHODS FOR BREAKING THE FORCE OF THE SEA AT THE ENTRANCE OF HARBOURS AND ELSEWHERE. |
| Div. 11 | ..... 10. METHODS OF COMMUNICATION FROM THE SHORE TO LIGHTSHIPS AND FISHING FLEETS BY SUBMARINE CABLES; TELEPHONE OR OTHER MEANS OF SIGNALLING. |
| Div. 12 | ..... 11. METHODS OF PROTECTING SUBMARINE CABLES FROM INJURY BY FISHING OPERATIONS (ILLUSTRATED BY MODELS AND DRAWINGS). |
| | *SECTION II.* **FRESHWATER FISHING.** |
| Div. 13 | ..... 1. SALMON NETS AND FIXED APPLIANCES FOR CATCHING SALMONIDÆ IN ALL THEIR VARIETIES. |
| Div. 14 | ..... 2. SALMON RODS, REELS, LINES, ARTIFICIAL FLIES AND BAITS, GAFFS, SPEARS, CREELS, &C. |
| Div. 15 | ..... 3. TROUT RODS, REELS, LANDING NETS, LINES, ARTIFICIAL FLIES, BAITS, BASKETS, BAGS, &C. |
| Div. 16 | ..... 4. PIKE, BARBEL, AND OTHER COARSE-FISH RODS, REELS AND TACKLE, ARTIFICIAL SPINNING BAITS, &C. |
| Div. 17 | ..... 5. TRAPS, NETS, BUCKS, WHEELS, AND ALL KINDS OF APPARATUS FOR CATCHING EELS, LAMPREYS, &C. |
| Div. 18 | ..... 6. HOOKS, &C. |
| Div. 19 | ..... 7. ANGLERS' APPAREL OF EVERY DESCRIPTION. |
| Div. 20 | ..... 8. BOATS, PUNTS, COBLES, COLLAPSIBLE, PORTABLE, &C., IN MODELS OR OTHERWISE. |

NOTE.—*The above classification is suggested as a convenient one for this class, but it is not intended to exclude any objects which come within the class.*

| Exhibitors to quote the Number in this column. | |
|---|---|
| | **CLASS II. ECONOMIC CONDITION OF FISHERMEN.** |
| Div. 21 | ..... 1. APPAREL AND PERSONAL EQUIPMENT. |
| Div. 22 | ..... 2. FOOD AND MEDICINE CHESTS. |
| Div. 23 | ..... 3. MODELS AND PLANS OF DWELLINGS. |
| Div. 24 | ..... 4. CONTRACTS OF PARTNERSHIPS; INSURANCES OF LIFE, BOATS, GEAR, &c.; BENEFIT SOCIETIES. |
| | **CLASS III. COMMERCIAL AND ECONOMIC.** |
| | 1. PREPARATION, PRESERVATION, AND UTILISATION OF FISH, AND ALL FORMS OF LIFE INCLUDED IN CLASS V. |
| | (*a*) For edible purposes— |
| Div. 25 | ..... i. Models of fish-curing establishments. Methods of, and models and other representations of any appliances for, drying, curing, salting, smoking, tinning, cooking, &c. |
| Div. 26 | ..... ii. Fish dried, smoked, cured, salted, tinned, or otherwise prepared for food. |
| Div. 27 | ..... iii. All products prepared from fish, such as oils, roes, isinglass, &c. |
| Div. 28 | ..... iv. Antiseptics suitable for preserving fish for food. |
| | (*b*) For other than edible purposes— |
| Div. 29 | ..... i. Oils, manures, and other products prepared from fish. |
| Div. 30 | ..... ii. Methods of, and models, and other representations of appliances for, preparing oils and manures from fish. |
| Div. 31 | ..... iii. Sea and fresh water pearl shells; mother-of-pearl manufactured; pearls sorted. |
| Div. 32 | ..... iv. Preparation and application of sponges, corals, pearls, shells, and all parts and products of aquatic animals, &c. to purposes useful and ornamental, with specimens. |
| | 2. TRANSPORT AND SALE OF FISH. |
| Div. 33 | ..... (*a*) Appliances for carrying fish and for preserving fish during transport or otherwise, and models of the same. |
| Div. 34 | ..... (*b*) Models of fish markets, and appliances connected with the same. |
| | **CLASS IV. FISH CULTURE.** |
| Div. 35 | ..... 1. MODELS OR DRAWINGS OF FISH HATCHING, BREEDING AND REARING ESTABLISHMENTS, INCLUDING OYSTER AND OTHER SHELLFISH GROUNDS; AND ALL APPARATUS AND IMPLEMENTS CONNECTED WITH THE SAME, AND FOR TRANSPORTING FISH AND FISH OVA. FOOD FOR FRY. |
| Div. 36 | ..... 2. REPRESENTATIONS ILLUSTRATIVE OF THE DEVELOPMENT AND PROGRESSIVE GROWTH OF FISH. |
| Div. 37 | ..... 3. MODELS AND DRAWINGS OF FISH PASSES AND FISH LADDERS. |
| | 4. SCIENTIFIC INVESTIGATION. |
| Div. 38 | ..... i. Models and drawing of diseases of fish, with special reference to their origin and cure. |

| Exhibitors to quote the Number in this Column. | |
|---|---|
| | **FISH CULTURE—*continued.*** |
| Div. 39 | ..... ii. Processes for rendering streams polluted by sewage and chemical or other works innocuous to fish life (illustrated by models and drawings). |
| Div. 40 | ..... iii. Physico-chemical investigation into those qualities of salt and fresh water which affect aquatic animals; investigation of the bottom of the sea and of lakes, shown by samples; aquatic plants in relation to fishing, &c.; researches into the aquatic fauna (animals of the several classes, preserved in alcohol or prepared, &c.); apparatus and implements used in such researches. |
| Div. 41 | ..... 5. ACCLIMATISATION OF FISH. |
| | **NATURAL HISTORY.** |
| | CLASS V. [AQUARIA.] |
| | 1. SPECIMENS, LIVING (MARINE AND FRESH WATER), FRESH STUFFED OR PRESERVED, CASTS, DRAWINGS, AND REPRESENTATIONS OF— |
| Div. 42 | ..... (*a*) Algæ to be arranged under genera and species with localities appended. |
| Div. 43 | ..... (*b*) Sponges, in their natural state. |
| Div. 44 | ..... (*c*) Corals, in their natural state, polyps, jelly-fish, &c. |
| Div. 45 | ..... (*d*) Entozoa and epizoa. |
| Div. 46 | ..... (*e*) Mollusca of all kinds and shells not included in Class III. |
| Div. 47 | ..... (*f*) Starfishes, sea urchins, holothuriæ. |
| Div. 48 | ..... (*g*) Worms used for bait, or noxious; leeches, &c. |
| Div. 49 | ..... (*h*) Perfect insects and larvæ of insects which are destroyers of spawn, or serve as food for fish. |
| Div. 50 | ..... (*i*) Crustacea of all kinds. |
| Div. 51 | ..... (*k*) FISH OF ALL KINDS. |
| Div. 52 | ..... (*l*) Reptiles, such as tortoises, turtles, terrapins, lizards, serpents, frogs, newts, &c. |
| Div. 53 | ..... (*m*) Aquatic and other birds hostile to fish or fishing. |
| Div. 54 | ..... (*n*) Aquatic and amphibious mammalia (otters, seals, whales, &c.) and others detrimental to fish. |
| Div. 55 | ..... 2. WORKS ON ICHTHYOLOGY. MAPS ILLUSTRATING GEOGRAPHICAL DISTRIBUTION, MIGRATION, &c., OF FISHES AND SPAWN. |
| Div. 56 | ..... 3. SPECIMENS AND REPRESENTATIONS ILLUSTRATIVE OF THE RELATIONS BETWEEN EXTINCT AND EXISTING FISHES. |
| | **HISTORY AND LITERATURE OF** |
| | CLASS VI. FISHING—FISHERY LAWS—FISH COMMERCE. |
| Div. 57 | ..... 1. ANCIENT FISHING IMPLEMENTS OR THEIR REPRODUCTIONS — MODELS — PICTURES—BOOKS — EMBLEMS — CHARTERS AND SEALS OF ANCIENT FISHERMEN GUILDS. |
| Div. 58 | ..... 2. FISHERY LAWS OF DIFFERENT COUNTRIES. |
| Div. 59 | ..... 3. COPIES OF TREATIES, CONVENTIONS, &C., DEALING WITH INTERNATIONAL FISHERY RELATIONS. |
| Div. 60 | ..... 4. REPORTS, STATISTICS AND LITERATURE OF FISH, FISHING, AND FISHERIES. |
| Div. 61 | ..... 5. REPORTS ON ACCLIMATISATION OF FISH, AND OF ATTEMPTS IN THE DIRECTION. |

Exhibitors to quote the Number in this Column.

## LOAN COLLECTIONS.

### CLASS VII. COLLECTIONS WITHIN THE SCOPE OF THE FOREGOING CLASSES.

### MONEY PRIZES.

The Committee will be prepared to receive and consider the offer of Money Prizes for any Special Exhibits or Essays connected with the objects of the Exhibition.

### ESSAYS. (*See pages XXII. and XXV.*)

CONFERENCES ARE PROPOSED TO BE HELD FOR THE PURPOSE OF READING AND DISCUSSING PAPERS ON SUBJECTS CONNECTED WITH THE EXHIBITION.

## REGULATIONS.

Royal Patronage.

1.—A Great International Fisheries Exhibition, under the patronage of Her Majesty the Queen and the Presidency of H.R.H. the Prince of Wales, will be held in London in 1883.

Date

2.—The Exhibition will be opened on the 12th of May by Her Majesty the Queen, and continue open for a period of not less than six months.

Objects.

3.—The principal objects to be admitted are comprised in the annexed Classification, which is intended to include all kinds of specimens of fish life, and to illustrate all the modes by which the MARINE and FRESH WATER animals of economic value are captured and utilised, together with the commercial, scientific, social, historic, and legislative aspects of such fisheries.

Rewards.

4.—Government and other Medals in Gold, Silver, and Bronze, and State Diplomas of Honour, will be awarded by a Jury, the composition of which will be settled later.

All expenses to be borne by Exhibitors.

5.—No charge will be made for space, but Exhibitors will have to pay every expense of transit, delivery, fixing, and removing their Exhibits, and they must, either personally or by their Agents, superintend the reception and installation, and at the close of the Exhibition, the removal of their goods; in default thereof, the Committee reserves to itself the right of doing whatever may be considered necessary, and at the expense of the Exhibitor.

Applications.

6.—Applications for admission must be made on printed forms, which will be supplied on application; these are to be sent to the Secretary in London on or before the 1st November, 1882.

Allotment.

7.—The General Secretary will, as soon as practicable, notify to applicants the decision of the Committee, and will indicate the space, if any, which has been accorded to them, and give to each a number.

Loan Department.

8.—Contributors to the Loan Department are requested to communicate with the Secretary, who will supply forms to be filled up by them.

Foreign Countries.

9.—The Foreign Correspondents that may be appointed are invited to enter *as soon as possible* into communication with the

Secretary. The Correspondent will be charged with the consideration of all questions relative to the distribution of the space allotted to his country. The Committee will therefore not correspond directly with foreign Exhibitors, except in those countries where no Correspondent is appointed.

Foreign Countries.

10.—The Committee will place at the disposal of Foreign Correspondents all information and plans that may be useful for their arrangements.

Foreign Countries.

11.—The applicants for space from countries in which no Correspondent has been appointed will correspond directly with the Secretary of the Committee.

Railway Rates.

12.—The Committee will endeavour to obtain, from the various English Railway Companies, special terms for the conveyance of exhibits to and from the Exhibition, and should they succeed in doing so, such arrangements will be communicated to intending Exhibitors.

Railways, etc.

13.—The Committee will not interfere in any way between the Railway Companies, the Carriers and the Exhibitors, with reference to the dispatch, transmission, reception, management, or return of goods exhibited.

Marks on Packages.

14.—All packages containing goods intended for exhibition must have painted on them the distinctive mark (I. F. E.) in red paint, and they must also have painted on them the name and number of the Exhibitor.

Waybills.

15.—The waybill accompanying all packages must contain the name of the Exhibitor, his number and address.

Exhibitors or Agents to Receive own Goods, etc.

16.—Each Exhibitor must provide, either personally or through an Agent, for the dispatch, transmission, reception, unpacking, and arrangement of his goods, and for the verification of their contents when unpacked. If neither the Exhibitor nor his Agent be present to receive the packages on arrival at the Exhibition the Carrier will be directed to take them away; but should any goods be deposited in the Exhibition premises during the absence of the Exhibitor or his Agent, the Committee will not be responsible for any loss or damage from whatsoever cause arising.

Foreign Packages.

17.—Packages from Foreign Countries must likewise have painted on them in distinctive marks the letters (I. F. E.) in red paint. They must be addressed to the Exhibitor himself or his Agent. They must all be marked in such a way as to show distinctly from whence they come, the name of the country and the number of the Exhibitor being painted legibly thereon.

Passages.

18.—Exhibition Spaces.—The space granted to an Exhibitor within the Building is available for floor space exclusive of the passages for the public.

Show Cases.

19.—Show Cases.—No particular form or design is prescribed for cases, counters, platforms, &c., but they must not exceed the following heights without the special written permission of the Committee:—

| | | | | |
|---|---|---|---|---|
| Show cases and partitions | | 10 feet | above the | floor. |
| Counters | .. .. | 3 | do. | do. |
| Platforms | .. .. | 1 foot | | do. |

Railings.

20.—Exhibitors may place Railings of a uniform height of 2 feet 6 inches above the floor level. In every instance the railings must be within the area of the "stand," *i.e.* the space allotted.

Floors.

21.—The flooring must not be altered, removed, or strengthened for the convenience of arrangement, except by sanction of the Committee, and at the expense of the Exhibitor.

No Obstructions.

22.—No Exhibitor will be permitted to display exhibits in such a manner as to obstruct the light or vistas through the avenues, or

to occasion inconvenience, injury, or otherwise disadvantageously affect the display of other Exhibitors.

Decorations.

23.—Decorations.—In order to ensure uniformity of decoration and general good effect, no Exhibitor will be allowed to put up any flags, banners, or other kind of decoration without permission.

Signs.

24.—Signs.—No sign or name-board may be placed otherwise than parallel with the main passages, that is, parallel with the frontage of the respective stands, and should be as near to the back of the space as possible, so as not to interfere with the vista. The signs to be black and gold. All signs must be hung subject to the approval of the Committee.

Placards.

25.—No printed or written bills may be displayed unless they are neat in design.

Exhibitors' Offices.

26.—Offices.—Any Exhibitor who may obtain permission to erect an office on his allotted space must conform to the following rules:—

The office must not exceed 8 feet in height: must be placed at the back of the stand, unless otherwise sanctioned; and must be painted black and varnished, with gilt beadings.

Empty Cases, immediate removal.

27.—The spaces outside the allotments for Exhibitors being required for the necessities of circulation, packages and empty cases will not be allowed to remain there. Cases must be unpacked as fast as received, and the empty cases taken away by the Exhibitors or their agents. The Committee decline to accept any responsibility with reference to empty cases, which must be at once removed from the building at the expense of Exhibitors.

Empty Cases.

28.—The Committee will have nothing whatever to do with warehousing or the preservation of empty cases, or reserve any space for the purpose.

Exhibitors to keep Stands clean.

29.—Exhibitors will be required to provide all necessary attendance and to keep their stands and exhibits properly cleaned and in good order during the whole period of the Exhibition.

Non-transfer.

30.—No Exhibitor will be allowed to transfer any allotment, or to allow any other than his own duly admitted exhibits to be placed thereon, except by permission of the Committee.

Exhibitor's Name.

31.—All goods exhibited must be in the name of the person who signed the application form.

Selling Price.

32.—Exhibitors, being traders, are requested to mark the selling price of the articles exhibited complete, so as to facilitate the judgment of the Jury, as well as for the information of visitors.

Non-removal and Perishable Articles.

33.—Objects sold cannot be taken away before the close of the Exhibition, without the special permission of the Committee. Special arrangements will be made with regard to perishable exhibits.

Water, Gas, or Steam Machinery in Motion.

34.—Exhibitors of apparatus requiring the use of water, gas, or steam, must state on applying for admission the quantity of water, gas or steam which they may consider necessary. Those who wish to show machinery in motion must state the rate of speed at which the machine is to be driven. The furnishing of all counter shafting, pulleys, gas, water, steam, &c., must be at the entire expense of the Exhibitor, but under the direct control of the Committee or their appointed officer.

Dangerous Substances.

35.—All fulminating and explosive substances and all dangerous substances are absolutely forbidden to be sent.

Receptacles.

36.—Spirits, alcohol, oils, essences, corrosive substances, and generally all substances which might spoil other articles or inconvenience the public, can only be received in solid and suitable vessels of small size.

Catalogue.

37.—The Committee reserve the sole right of compiling a catalogue of *the exhibits under regulations* which will be duly notified.

Each nation will, however, have the right to produce, at its own expense, but in its own language only, a catalogue of all the objects in its own Section.

Hand-bills.

38.—All hand-bills, printed matter, &c., for gratuitous distribution, connected with exhibits, will be under special regulations, and must first receive the approval and permission of the Committee, which may be withdrawn at any time.

No photographs, etc.

39.—No article exhibited may be photographed, drawn, copied, or reproduced, in any manner whatsoever, without the special sanction of the Committee.

Non-liability for Loss or Damage.

40.—The Committee will not hold itself responsible for any loss or damage occurring to any exhibit from any cause whatsoever, but, while declining any responsibility, it is the intention of the Committee to take such precautions as they deem necessary.

Future Arrangement as to Date of Reception and Jury.

41.—Future regulations will settle in due time the arrangements for the date of reception, location of goods, tickets of admission for Exhibitors and assistants, and the formation and working of the Jury.

Right to alter Rules.

42.—The right to add to, alter, amend, or expunge, any of these Rules is reserved by the Committee.

All Rules binding.

43.—Both Englishmen and Foreigners in becoming Exhibitors declare by so doing their compliance with the whole of these Regulations, together with such other Regulations as the Committee may issue from time to time.

44.—The Committee reserve the right to remove the objects belonging to any Exhibitor who shall not conform to the Regulations.

Non-liability for Accidents.

45.—If any damage or injury shall be caused or occasioned during the Exhibition by any exhibited machine, implement, or article to any visitor or other person, or to any officer, servant, or others then and there employed by the Committee of the Great International Fisheries Exhibition, 1883, then the Exhibitor to whom such machinery, implement, or article may belong shall indemnify and hold harmless the said Committee from and against all actions, suits, expenses, and claims on account or in respect of any such damage or injury which may be so caused or occasioned

| SUBJECTS FOR PRIZE ESSAYS. | VALUE. | NAME OF DONOR. |
|---|---|---|
| II.—The effect of the existing National and International Laws for the Regulation and Protection of Deep-sea Fisheries, with Suggestions for Improvements in said Laws .. .. .. .. | £100 | THE COMMITTEE OF THE GREAT INTERNATIONAL FISHERIES EXHIBITION. |
| III.—Relations of the State with Fishermen and Fisheries, including all matters dealing with their Protection and Regulation .. | £100 | |
| NOTE.—This would relate to Home Legislation affecting Regulations for Fishing vessels, Protection of Spawning beds, Close Time (if any) for Salt-water Fish. | | |
| IV.—On Improved Facilities for the Capture, Economic Transmission and Distribution of Sea Fishes .. .. .. .. .. | £100 | |
| NOTE.—On improved Nets and Modes of catching Salt-water Fish, the Application of Steam to Deep-sea Fisheries, the Advantages of Steam Carriers, greater facilities to be given by Railway Companies in regard to Rates, Refrigerating Vans, new and improved Fish Markets, Cold Storing-rooms for ditto. | | |
| V.—On Improved Fishery Harbour Accommodation for Great Britain and Ireland, indicating the localities most in need of such Harbours, the general principles on which they should be constructed, and the Policy the State should adopt in aiding and encouraging Harbour Accommodation for Fishing purposes .. .. .. .. .. .. | £100 | |
| NOTE.—The effect of the Passing Tolls Act, 1861, the causes which led to its failure, grants to supplement local efforts, loans at low rate of interest, period to which they should be extended. | | |
| VI.—The Best Appliances and Methods of Breaking the Force of the Sea at the Entrance to Harbours and elsewhere .. .. | £100 | |
| VII.—On the Food of Fishes both in Fresh and Salt Water, accompanied by Illustrations and Preparations .. .. .. .. .. | £50 | |

| SUBJECTS FOR SPECIAL PRIZES. | VALUE. | NAME OF DONOR. |
|---|---|---|
| *SECOND-CLASS PRIZES.* | | |
| I.—On the Legislation at present applicable to the Salmon Fisheries in Scotland (including the Rivers Tweed and Solway), and the best means of Improving it | £25 | THE COMMITTEE OF THE GREAT INTERNATIONAL FISHERIES EXHIBITION. |
| II.—On the Legislation at present applicable to the Salmon Fisheries in England and Wales, and the best means of Improving it .. .. .. .. .. .. .. | £25 | |
| III.—On the Legislation at present applicable to the Salmon Fisheries in Ireland, and the best means of Improving it .. .. | £25 | |
| IV.—On the Introduction and Acclimatisation of Foreign Fish .. | £25 | Sir HENRY PEEK, Bart., M.P. |
| V.—On the Propagation of Freshwater Fish, excluding Salmonidæ .. .. .. .. .. .. .. | £25 | Sir HENRY PEEK, Bart., M.P. |
| VI.—On the Propagation of the Salmonidæ .. .. .. .. .. | £25 | THE COMMITTEE OF THE GREAT INTERNATIONAL FISHERIES EXHIBITION. |
| VII.—On Salmon Disease: Its Cause and Prevention .. .. .. .. | £25 | THE MARQUESS OF HAMILTON |
| VIII.—On Oyster Culture .. .. .. | £25 | THE LIVERPOOL FISH TRADE ASSOCIATION. |
| IX.—On the best Method which has been practically tested of cultivating Crustacea .. .. .. | £25 | THE COMMITTEE OF THE GREAT INTERNATIONAL FISHERIES EXHIBITION. |
| X.—On the best Means of increasing the Supply of Mussels and other Molluscs (Oysters excepted) used either for Bait or Food .. .. | £25 | W. AMHURST-TYSSEN AMHERST, Esq., M.P. |
| XI.—On the best System of Life Insurance for Fishermen, and of Insuring Boats, Gear, Nets, etc. | £25 | THE COMMITTEE OF THE GREAT INTERNATIONAL FISHERIES EXHIBITION. |
| XII.—A Descriptive Account of the Angling Societies of the Metropolis, showing their Origin, Extent, and Constitution; as well as of the Benevolent Organisations attached to them .. .. | £25 | |
| XIII.—On the Currents, Temperatures, and other Physical Conditions of the Sea in relation to Reproduction, Growth, and Migrations of Fish .. .. .. .. .. | £25 | |
| XIV.—On the History of Dutch Sea Fisheries, their Progress, Decline, and Revival, especially in connection with the Legislation on Fisheries in earlier and later Times .. .. .. .. | £25 | |
| XV.—On the Herring Fisheries .. | £25 | |
| XVI.—On the Natural History and Cultivation of the Sole .. .. | £25 | THE LIVERPOOL FISH TRADE ASSOCIATION. |

## REGULATIONS.

I. All competitors shall enclose their names and addresses in a cover to the Secretary; the subject of their Essays and their motto to be clearly written on the outside of such cover.

II. Jurors will be appointed to adjudicate upon the various Essays, and, where possible, it is proposed to secure the aid of foreign experts for this purpose.

III. After the Jurors have awarded the Prizes, the covers above referred to shall be opened in the presence of the Chairman of the Essay Committee and the Secretary, who shall declare the names of the successful Competitors.

IV. The Committee of Management have power to publish the whole, or part of any, that may be submitted to competition. Essays not published will be returned on the application of the writers, but the Committee of Management do not make themselves, or any of the officers of the Exhibition, liable for the loss of any Essay or Essays.

V. The Judges are not bound to award a Prize unless they consider one of the Essays deserving of it.

VI. No Prize shall be given for an Essay which has already appeared in print.

VII. All Essays, with the motto attached, must be addressed to the Secretary of the Great International Fisheries Exhibition, 1883, London.

VIII. Every Essay must be written in the English language, or must be accompanied by an English translation, and must be sent in, so as to arrive at the offices of the Exhibition, on or before May the 1st, 1883.

## LIST OF SPECIAL PRIZES SUPPLEMENTARY TO THE REWARDS DESCRIBED IN PARAGRAPH 4 OF THE REGULATIONS.

*N.B.—The following Subjects for Prizes have been decided on, and are recommended by the Committee for adoption by the Public, and they will be glad to receive Subscriptions from Public bodies or private individuals willing to take up any one or more. The whole of the Prizes announced will* IN ANY CASE *be given (if awarded by the Jurors) by the Committee or from other sources.*

| SUBJECTS FOR SPECIAL PRIZES. | VALUE. | NAME OF DONOR. |
|---|---|---|
| **SEA-FISHING.** | | |
| 1.—Apparatus and Gear complete for a Trawler—Sail or Steam .. .. | £15 | THE LOWESTOFT FISH TRADERS. |
| 2.—Apparatus and Gear complete for a Drifter .. .. .. .. .. | £15 | |
| 2A.—Collection of Bowls, Buoys, and Bladders, for Drift and Surface Fishing .. .. .. .. .. .. | £10 | THE COMMITTEE OF THE GREAT INTERNATIONAL FISHERIES EXHIBITION. |
| 3.—Model or Specimen of an Improved Trawl Net, capable of allowing immature Fish and Refuse to escape therefrom .. .. .. .. | £52 10s. | THE MAYOR AND CORPORATION OF YARMOUTH. |
| 4.—Herring Net .. .. .. .. .. | £10 | J. L. SAYER, Esq. |
| 5.—Mackerel Net .. .. .. .. .. | £10 | J. L. SAYER, Esq. |
| 6.—Stow Net.. .. .. .. .. .. | £5 | THE COMMITTEE OF THE GREAT INTERNATIONAL FISHERIES EXHIBITION. |
| 7.—Bratt Net.. .. .. .. .. .. | £5 | |
| 8.—Sprat Net.. .. .. .. .. .. | £5 | |
| 9.—Collection of Rope suitable for Fishing Vessels .. .. .. .. | £10 | |
| 10.—Collection of Long Lines, Hand Lines, and Snooding .. .. .. | £5 | |

| SUBJECTS FOR SPECIAL PRIZES. | VALUE. | NAME OF DONOR. |
|---|---|---|
| 11.—Collection of Long Line Gear, Complete .. .. .. .. .. | £5 | The Committee of the Great International Fisheries Exhibition. |
| 12.—Collection of Hand Line Gear, Complete .. .. .. .. .. | £5 | |
| 13.—Collection of Hooks .. .. .. | £10 | |
| 14.—The Best and most Improved Mode of Curing Pilchards so as to make them an Article of Food for Home Consumption. Trial to take place as soon as the Pilchard Fishing commences in 1883, for Home Consumption within ten days .. | £20 | |
| 15.—For Improvements in the Method of capturing Pilchards at a Distance from the Land with Seine Nets | £10 | |
| 16.—For the Best and most Economical Mode, consistent with efficiency, of Preserving Nets and Tackle from Rotting .. .. .. .. | £20 | B. M. Bradbear, Esq., £10. The Town of Lowestoft, £10. |
| 17.—For Lobster and Crab Pots, permitting the escape of those under-sized .. .. .. .. .. .. | £10 | The Committee of the Great International Fisheries Exhibition. |
| 18.—Model of a Steam Trawler .. .. | £25 | |
| 19.—Model of a Steam Fishing Vessel, best adapted to Herring and other Fisheries .. .. .. .. | £25 | Lowestoft Town Commissioners. |
| 20.—Model of a Steam Fish Carrier .. | £52 10s. | London Fish Trade Association. |
| 21.—Model of a Sailing Trawler .. .. | £25 | R. D. Odell, Esq., £20. Mr. Deputy James Bell, £10. |
| 22.—Model of a Drifter for the Herring Fisheries .. .. .. .. .. | £25 | |
| 23.—Model of a Well Vessel adapted for Cod and other Fisheries .. .. | £10 | The Committee of the Great International Fisheries Exhibition. |
| 24.—Model of a Stow Boat as used for Sprat and other Fisheries .. .. | £10 | |
| 25.—Model of a Shrimp Boat .. .. | £10 | Messrs. Lynn & Gibson. |
| 26.—Boat, full size, complete with all fittings, for Off-shore Fishing in rough weather, requiring not more than four hands—the first consideration being stability in a surf; the second, cost; the third, weight .. .. .. .. .. .. | £15 | Captain H. M. Hozier. |
| 27.—Model of a Boat with a handier and safer rig than the Lug-sail, and not requiring to be dipped at every tack in beating to windward .. .. .. .. .. .. | £10 | The Committee of the Great International Fisheries Exhibition. |
| 28.—Rowing Coble (full size) .. .. | £10 | |
| 29.—Model of Boat used in the Whale and Seal Fisheries, together with all kinds of Apparatus and Tackle used in those Fisheries .. .. | £20 | |
| 30.—Model of a Fishing Boat of not less than 45 feet keel, adapted to the Fisheries on the East Coast of England and Scotland (having special regard to the rig and prevention of shifting of Ballast) .. | £25 | The Hon. E. Marjoribanks, M.P. |

| SUBJECTS FOR SPECIAL PRIZES. | VALUE. | NAME OF DONOR. |
|---|---|---|
| 31.—Boat best adapted for conveying Fish from the Catcher to the Carrier .. .. .. .. .. .. .. | £60 | GEORGE EDWARDS, Esq. |
| No Prize will be awarded unless the Boat is especially adapted to preserving the lives of her crew. | | |
| 32.—Model of a Boat adapted for the Drift Fisheries both of Mackerel and Pilchard .. .. .. .. | £10 | THE COMMITTEE OF THE GREAT INTERNATIONAL EXHIBITION. |
| 33.—Collection of Canvas suitable for Fishing Vessels .. .. .. .. | £10 | |
| 34.—Steam Capstan for Fishing purposes .. .. .. .. .. .. .. | £10 | THE TOWN OF LOWESTOFT. |
| 35.—Hand Capstan for Fishing purposes .. .. .. .. .. .. .. | £10 | |
| *LIFE-BOATS, LIFE-SAVING APPARATUS, &c., &c.* | | THE COMMITTEE OF THE GREAT INTERNATIONAL FISHERIES EXHIBITION. |
| 36.—For the best full-sized Life-boat, fully equipped and on a carriage, adapted to aid stranded or wrecked Vessels, from the Shore, in Gales of Wind, and through heavy broken Seas and Surf .. | £600 | |
| 36A.—For the best Model of a Life-boat, to be made to a scale not exceeding 1½ inches, nor less than half an inch to the foot, each Model to be accompanied by a certificate of the scale to which it is built .. | £75 | HEYWOOD LONSDALE, Esq. |
| *Competitors for Prize No. 36 are not eligible for this Prize.* | | |
| 37.—Life-Saving Apparatus of every Description .. .. .. .. .. .. | £25 | THE MARQUIS OF EXETER. |
| 37A.—For the most suitable Life-Jacket, or Dress, for preserving the lives of Fishermen engaged in ferrying or transporting Fish from Smacks to Carriers. The principal requisites are, that it should be of such a nature as to be of as little encumbrance as possible to the wearer, and also available at all times when he is engaged on that duty .. .. .. .. .. .. .. | £25 | HEYWOOD LONSDALE, Esq. |
| 38.—Illustrations, by Models or otherwise, of Methods of Breaking the Force of the Waves at the Entrance of Harbours .. .. .. | £50 | THE COMMITTEE OF THE GREAT INTERNATIONAL FISHERIES EXHIBITION. |
| 39.—The Best Method of Communication from the Shore to Fishing Fleets .. .. .. .. .. .. .. | £25 | |
| 40.—The Best Method of protecting Submarine Cables from injury by Fishing operations .. .. .. | £10 | |

| SUBJECTS FOR SPECIAL PRIZES. | VALUE. | NAME OF |
|---|---|---|
| **FRESH-WATER FISHERIES.** | | |
| In awarding Prizes in this Section, 41 to 59, regard will be had rather to the excellence than to the number of Exhibits in each Collection. | | |
| 1.—*FLY-FISHING.* | | |
| 41.—Collection of Salmon Rods .. .. | £10 | W. BURDETT-C |
| 42.—Collection of Trout Rods .. .. | £10 | |
| 43.—Collection of Split-cane Rods .. | £5 | |
| 44.—Collection of Salmon or Trout Reels | £5 | |
| 45.—Collection of Salmon Lines .. .. | £10 | THE COMMIT GREAT I FISHERIES E |
| 46.—Collection of Trout Lines .. .. | £10 | |
| 47.—Collection of Salmon and Trout Gut Casts .. .. .. .. .. | £10 | |
| 48.—General Collection of Flies .. .. | £10 | |
| 49.—General Collection of Salmon or Trout Flies for England .. .. | £5 | D. VIGO, Esq. |
| 50.—General Collection of Salmon or Trout Flies for Scotland .. .. | £5 | MESSRS. SAYER |
| 51.—General Collection of Salmon or Trout Flies for Ireland .. .. | £5 | |
| 52.—Collection of Materials used in Dressing Salmon and Trout Flies | £5 | |
| 2.—*FISHING OTHER THAN FLY-FISHING.* | | |
| 53.—Collection of Rods other than Fly Rods .. .. .. .. .. .. | £10 | |
| 54.—Complete Collection of Tackle and Angling Appliances .. .. .. | £10 | |
| 55.—Complete Collection of Tackle and Angling Appliances for Bottom-Fishing, comprising minimum of Cost with excellence .. .. .. | £10 | |
| N.B.—For this Prize each Exhibitor must quote the price at which he will guarantee to supply any number of his Exhibit. | | THE COMMIT GREAT I FISHERIES E |
| 56.—Collection of Artificial Baits .. | £10 | |
| 3.—*MISCELLANEOUS.* | | |
| 57.—Collection of Gut in successive stages of manufacture.. .. .. | £5 | |
| 58.—Collection of Hooks of all Descriptions for Fresh-water Fishing .. | £10 | |
| 59.—Collection of Boots, Waders, Fishing Stockings, Brogues, &c. .. | £5 | |
| 60.—Suit of Angler's Apparel, including Hat .. .. .. .. .. .. | £5 | |
| 61.—Eel Trap for Rivers, not to interfere with other Fisheries .. .. | £10 | |
| 62.—Salmon Net .. .. .. .. .. | £10 | |
| 63.—Punt for Fishing purposes .. .. | £10 | |
| *64.—Rowing Boat for Fishing purposes* | £10 | |
| *65.—Portable or Collapsible Boat* .. | £10 | |

| SUBJECTS FOR SPECIAL PRIZES. | VALUE. | NAME OF DONOR. |
|---|---|---|
| **ECONOMIC CONDITION OF FISHERMEN.** | | |
| 66.—Exhibit of Waterproof Clothing for Sea Fishermen .. .. .. | £10 | THE COMMITTEE OF THE GREAT INTERNATIONAL FISHERIES EXHIBITION. |
| 67.—Exhibit of Sea Fishermen's Clothing, other than Waterproof .. | £10 | |
| **COMMERCIAL AND ECONOMIC.** | | |
| 68.—Model of Fish-Curing Establishment .. .. .. .. .. .. | £75 | TOWN OF YARMOUTH. |
| 69.—Collection of Smoked Fish .. .. | £20 | THE COMMITTEE OF THE GREAT INTERNATIONAL FISHERIES EXHIBITION. |
| 70.—Collection of Pickled and Salted Fish .. .. .. .. .. .. | £10 | |
| 71.—Collection of Dry Salted Fish .. | £10 | |
| 72.—Collection of Tinned Fish of all Kinds .. .. .. .. .. .. | £10 | |
| 73.—For the best Apparatus for the Conveyance of Yearling Salmonidæ, by Road and Rail .. .. | £10 | THOMAS JAMES MANN, Esq. |
| 74.—Refrigerating Apparatus for Fishing Vessels .. .. .. .. .. | £20 | THE COMMITTEE OF THE GREAT INTERNATIONAL FISHERIES EXHIBITION. |
| 75.—The Best and most Economical Machine for the Manufacture of Ice for Fishing purposes .. .. | £10 | |
| 75A.—Designs for a Fish Market.. .. | £52 10s. | THE CORPORATION OF LIVERPOOL. |
| 76.—Model and Plans of a Fish Market | £20 | THE BARONESS BURDETT-COUTTS. |
| **FISH CULTURE.** | | |
| 77.—For the best Hatching Apparatus for Salmonidæ .. .. .. .. | £5 | COLONEL CUSTANCE. |
| 77A.—For the best Coarse Fish Hatching Apparatus .. .. .. .. | £5 | THE COMMITTEE OF THE GREAT INTERNATIONAL FISHERIES EXHIBITION. |
| 77B.—For the best Deep-sea Hatching Apparatus .. .. .. .. .. | £5 | |
| 77C.—For the best Rearing Apparatus.. | £5 | |
| 77D.—For the best Living Specimens of Yearling Trout, not less than twenty-five in number .. .. | £3 | |
| 78.—For the best Fish Culture Establishment for Hatching and Rearing 100,000 Salmonidæ, combining Efficiency with Economy .. | £15 | |
| 79.—For the best Fish Culture Establishment for Hatching and Rearing 300,000 Salmonidæ and upwards, combining Efficiency with Economy .. .. .. .. .. | £25 | |
| 80.—For the Best and Most Practical Model or Plan of a Series of Fish Ponds for the Culture of Fresh-water Fishes, the scale to be not less than 1 inch to the yard, and not to exceed 3 inches to the yard | £12 | JAMES H. CROSSMAN, Esq. |
| 80A.—For the Best Description of the way in which Fish Ponds can be Constructed, and Guidance for their Management .. .. .. | £3 | |

| SUBJECTS FOR SPECIAL PRIZES. | VALUE. | NAME OF DONOR. |
|---|---|---|
| 81.—For the best Apparatus for, or Method of, protecting Young Brood and Oysters against Dog Whelks and other natural enemies.. .. | £10 | THE COMMITTEE OF GRAND INTERNATIO FISHERIES EXHIBITION. |
| 82.—For the Best and most Economical Invention or Improvement of any Implement or Apparatus * for use in the Culture of Shell-fish .. | £10 | |
| **NATURAL HISTORY.** | | |
| 83.—A Collection of Stuffed Fresh-water Fish, taken with Rod and Line within the United Kingdom, *bonâ fide* the property of London Angling Clubs, and caught by their present or past members only .. .. .. .. .. .. | £20 | THE COMMITTEE OF GREAT INTERNATIO FISHERIES EXHIBITION |
| 84.—A Collection of Stuffed Fresh-water Fish, taken with Rod and Line within the United Kingdom, *bonâ fide* the property of Provincial Angling Clubs, and caught by their present or past members only .. .. .. .. .. .. | £20 | |
| 85.—A Collection of Stuffed Fish, shown by and the *bonâ fide* property of a private Exhibitor, all being taken with Rod and Line within the United Kingdom .. .. .. | £20 | |
| 86.—Collection of Fresh-water Fish, made and exhibited by private individuals .. .. .. .. .. | £5 | |
| 87.—Collection of Thames Trout, caught by Exhibitor, with Rod and Line | £10 | |
| 88.—Collection of Salmo Fario, in all varieties, caught by Rod and Line, and caught by Exhibitor.. | £10 | |
| 88A.—Best Specimens of Taxidermy, more particularly with regard to Stuffed Fish. | £10 | |
| *INDIVIDUAL SPECIMENS OF LOAN COLLECTION, CAUGHT BY ROD AND LINE.* | | |
| 89.—Salmo Salar .. .. .. .. .. | £5 | THE COMMITTEE OF GREAT INTERNATIO FISHERIES EXHIBITIO |
| 90.—Salmo Ferox .. .. .. .. .. | £5 | |
| 91.—Salmo Eriox .. .. .. .. .. | £5 | |
| 92.—Salmo Trutta .. .. .. .. | £2 10s. | |
| 93.—Salmo Fario, in any variety .. | £5 | |
| 94.—Thames Trout .. .. .. .. | £5 | |
| 95.—Grayling .. .. .. .. .. | £2 10s. | |
| 96.—Pike .. .. .. .. .. .. | £5 | |
| 97.—Perch .. .. .. .. .. .. | £2 10s. | |
| 98.—Carp .. .. .. .. .. .. | £2 10s. | |
| 99.—Tench .. .. .. .. .. .. | £2 10s. | |

* These terms are used in their widest sense.

| SUBJECT FOR SPECIAL PRIZES. | VALUE. | NAME OF DONOR. |
|---|---|---|
| 100.—Barbel .. .. .. .. .. .. | £2 10s. | THE COMMITTEE OF THE GREAT INTERNATIONAL FISHERIES EXHIBITION. |
| 101.—Bream .. .. .. .. .. .. | £2 10s. | |
| 102.—Chubb .. .. .. .. .. .. | £2 10s. | |
| 103.—Roach .. .. .. .. .. .. | £2 10s. | |
| 104.—Rudd .. .. .. .. .. .. | £2 10s. | |
| 105.—Dace .. .. .. .. .. .. | £2 10s. | |
| 106.—Burbolt (Eel-Pout) .. .. .. | £2 10s. | |
| 107.—Eel .. .. .. .. .. .. .. | £2 10s. | |
| 108.—Black Bass .. .. .. .. .. | £2 10s. | |
| 109.—Sturgeon .. .. .. .. .. | £5 | |
| N.B.—Prizes will be awarded for Specimens of Fresh-water Fish not included in this List. | | |

# INTRODUCTION.

Fishing and Fishermen are subjects which peculiarly commend themselves to those who are interested rather in the foundations than in the surface of society, for they are by their very nature unobtrusive and remote from view. No huge chimneys poison the air as a necessary accompaniment to their labours; no great cities rise up to contain their manufactures; no gigantic hoardings advertise their importance. Fishermen do not meet us at every turn like agricultural labourers in the country, or the tradesmen and mechanics in the cities; nor, except in the presence of a shop here and there, does their occupation leave the slightest perceptible trace in a provincial or a metropolitan town. As for the fish themselves, they not unnaturally prefer the quiet depths of the ocean to the most luxurious slab of a fishmonger's shop, or the most delicate attentions of a west-end cook. Everything connected with the industry is, in fact, almost wholly concealed from the view of those not directly employed in carrying it on. Its principal scene of maintenance is on the desolate ocean, out of sight for the most part, not merely of the dwellers upon the shore, but even of the passing ships which traverse the watery wastes. The towns and villages which its pursuers inhabit are frequented by few except the masters and the workmen of the craft; the markets are rare, and their surroundings by no means inviting; and even the shops receive but passing notice or recognition. To many persons all that represents the fisherman's craft consists of a single dish in the course of an elaborate dinner; and not many years have elapsed since the habitual use of fish, except on festive occasions, was considered in a middle-class household as a symptom of extravagance rather than of thrift. And yet how vast an interest is overlooked by so superficial a view will be evident upon very slight reflection. For in fact neither

hunting, nor shooting, nor agriculture itself, nor any mode whatsoever of obtaining the necessaries of existence for the mouths which clamour for them can vie with this ancient and wide-spread industry. Fishing, so far as the prime object of all labour, the sustentation of human life, is concerned, is an occupation which claims one entire element of the terraqueous globe for its undisputed province. There is scarcely a country throughout the world, from Greenland to Carpentaria, and from America to Japan, to the shores of which the fishing-boat is a stranger. Nor does this statement by any means exhaust the whole case. Not in the sea alone can this interesting and remunerative occupation be pursued with advantage, for lakes and rivers in every land teem with superabundant resources prodigal of food and wealth. However much therefore the increase and multiplicity of devices for the capture of fish may have escaped general notice, there can be little wonder that they should have attracted the attention of such as give their minds to the furtherance of the welfare of their countrymen, and more particularly to the development of such resources and industries as may most conduce to the support of a constantly increasing population.

Suggestions for the furtherance of these interests have been made in Blue Books over and over again, as in the proposal to convert the unfrequented bays and recesses of our coasts into beds for the cultivation of fish, and in the endeavours to obtain the establishment of a Government vessel for the instruction and assistance of fishermen, repeatedly made by the late Mr. Frank Buckland; to whose memory no monument could be erected either more in accordance with his own desire, or more worthy of the debt of gratitude owed to him by the nation, than such an institution. But Blue Books are easily read, and still more easily left unread, and nothing speaks so forcibly in behalf of a reform as a practical example of its utility made patent to the eyes of all men. It is in carrying out such objects as these that Exhibitions, National and International, discharge their most distinctive and salutary functions. They collect in a single focus the scattered rays which illuminate the recesses of the body politic; they present in a visible and striking form those features of our industrial and social life which almost of necessity escape common observation, and so

to speak, they place beneath a hive of glass the operations and domestic habits of our human bees.

Few articles connected with Fishing were displayed at the World's Fair of 1851; and such as there were came almost entirely from the United Kingdom. Angling, in fact, was but little known or appreciated in foreign parts, and there was probably no other country where the manufacturers of tackle constituted in themselves a distinct trade. Twenty-five British Exhibitors contributed such sportsman's gear as rods, lines, artificial flies, and baits; while, with the exception of some apparatus for float-fishing emanating from France, no foreign manufacturer sent an exhibit illustrative of fishing, either in salt or fresh water. The model of a smack, however, fitted with auxiliary screw propeller attracted general notice, as the principle had not been previously applied to this class of vessel. Nor were matters performed on a much larger scale when, eleven years later, a second opportunity was afforded in our metropolis, though some ingenious machinery was shown for the manufacture of nets, together with a fine assortment of tackle, and models of vessels for service at home and abroad. In 1867 the Imperial Commissioners at Paris offered a reward for co-operating societies in connection with the Exposition, and amongst the successful competitors was the Free Fisheries Society of Whitstable, incorporated in 1793, and established as a working fishery guild long before. At Vienna in 1873 models of Swedish and Norwegian fisheries were displayed, and at Philadelphia three years later was presented a capital machine, invented by Messrs. Baron, and subsequently improved by Pocqueur, for making nets. Another most noticeable feature in Philadelphia was a complete collection, in papier maché, of the varied and valuable Marine Fauna or Pisca (if we may coin such a term) of North America.

Like all vigorous and well-conceived ideas, the notion of a Great International Collection of works of industry like the World's Fair of 1851, gave birth to similar enterprises of a more limited and partial scope. Beneath the wonderful influence exercised by the first and most beautiful of them all, local and special exhibitions grew up almost from year to year for all sorts of objects and in all sorts of places. In these specialities Cork led the way in 1852 with a

collection of Irish Arts and Manufactures, and in the following year New York, New Brunswick, and Madras gave illustration of their native productions. Munich and Madrid, Christiania and Brussels, Berne, Sardinia, Hanover and St. Petersburg, promptly took up the cue thus given. Within the last thirty years scarcely any land has been without the advantages derived from a public display illustrative of national life. There have been Exhibitions from Thurso to Ballarat, and from Paris to Nagasaki. There have been Exhibitions of particular industries, Exhibitions of Arts, Exhibitions of Treasures, Exhibitions of the Apparatus of Labour, Exhibitions of the Apparatus of Science, Exhibitions of Corn, of Wine, and of Needlework. The Dairies of Europe have vied with each other at Hamburg; Casques and Bronzes have met in assembly at Kioto; even the bees have had their own Exhibition in London, and the very Fungi have held a Congress all to themselves at Aberdeen.

At last, fourteen years from the commencement of this magnificent series of industrial, art, and scientific triumphs, Fishing and Fisheries asserted their claim to a special display. Boulogne, with its semi-aquatic inhabitants and its frequent memorials of those who have perished in the waters, was the first to open its doors, though both Arcachon and Havre followed its example at a subsequent period. Especial prominence must be given to the important Maritime Exposition held at the former of these two last-mentioned towns; an enterprise which resulted—as we trust will be one of the results of our own Exhibition—in a great development and improvement of pisciculture. The Hague also was the scene of a similar collection in 1867, as was Naples in 1871. But the International Fisheries Exhibition held at Berlin in 1880 eclipsed all others in extent and variety. Nine great divisions were not more than sufficient for the multiplicity of the objects collected, which ranged from the specimens of corals and oysters, and from dried, salted, and smoked preparations, to documents and emblems, and seals, and all the multifarious statistics bearing upon the history of the fishing industry.

It would be foreign to our purpose to dwell upon the particular specimens exhibited at Berlin, yet one class of objects was of so striking a character as to give an excellent example of the

incidental illustrations of nature which are, as it were, the perquisites and rewards of those who endure the labours of such multifarious tasks as are involved in the establishment of an International Exhibition. The magnificent collection of sea-fowl was in itself found worthy of prolonged attention. There were the Falconidæ, the Fagins of aquatic fowl, who get their prey through the medium of less subtle but more active birds; the Pandionidæ, haunters of salt and fresh water alike, but lovers in particular of the rocky islands in the Tuscan sea; the Ardeidæ (the herons), to which the *Egretta Alba* of Venice belongs; the Phœnicopteridæ (the flamingoes), which pass in flights year by year over the Sardinian shores; the Procellaridæ (the petrels), including that unique bird the Oceanides Wilsoni, whereof a single specimen alone in the world is preserved in the Museum of Cagliari; and with them were many other different kinds of fowl which follow the human fashion of feeding upon the inhabitants of the waters.

From Germany this admirable and most politic conception passed over into England. We are indebted to Norwich, the capital of the county distinguished for its fishing enterprise from time immemorial, for first localising it within these islands. The germ of the idea was due to the Yare Preservation and Angling Society, and more specifically to one of its most distinguished members, Mr. Howard Taylor. At the Annual Meeting of this Association in 1879, Mr. Taylor suggested the institution of a Fish Museum at Norwich; while, at the same time, an Act was passed for the protection and preservation of fish in relation to the county through the instrumentality of the same Society. From the legislation arising out of this movement sprang the important Society for the Acclimatization of Fish; and when the project of a museum was found difficult of execution, their Secretary, Mr. Oldham Chambers, conceived the happy notion of holding a Fisheries Exhibition in the county capital—a proposition warmly accepted and endorsed by their President, Mr. Birkbeck, the Member for the Northern Division of the county. A small and energetic Executive soon threw themselves into the work, and just as the project of a Museum had been superseded by that of an Exhibition, so now the local character of the institution gradually widened into a national undertaking. Several public bodies quickly

recognised the value of the design, and assistance flowed in from many quarters. A handsome donation was voted for the purpose by the Corporation of London, and that ancient City guild, the Fishmongers' Company, then as now lent their powerful influence.

Government recognition was also obtained, chiefly through the agency of Mr. Birkbeck, and an official sanction was procured for holding the Exhibition at Norwich, and for granting medals and diplomas of merit. From the moment of its inception, the Prince of Wales and the Duke of Edinburgh took a lively interest in furthering the project, and its happy execution was in no small degree owing to the assistance afforded by their Royal Highnesses.

The success attained at Norwich at once put in motion the enterprise of our Northern neighbours. At the instance of the Highland and Agricultural Society, Mr. Menzies paid a visit to the Norwich Exhibition, and his report was so favourable that the Scottish Society resolved upon following suit in the succeeding year. Amongst the objects especially noticed at Edinburgh was the Swedish collection of fish and fish-derived products, such as isinglass and gelatine. One young lady in particular exhibited a most ingenious and beautiful set of brooches and ornaments made entirely of fish-scales. Much interest also was felt in the exhibits contributed by Professor Nordenskjöld, of the fishing-tackle used by the tribes frequenting the borders of the Arctic Ocean, and by the Esquimaux of the Port of Cloimu. Some valuable contributions to our knowledge upon points connected with these matters were obtained in the essays presented by various experienced writers, notably in that contributed by Mr. George Sim upon the "Natural History of the Herring," in an account of the "Harbour Accommodation of Scotland," given by Mr. Young, Inspector of Salmon Fisheries, and in a disquisition upon the different methods of Oyster Culture.

Meanwhile a movement was set on foot again under the auspices of Mr. Birkbeck, for repeating, upon a grander scale in London, the experiment so admirably initiated at Norwich. A very influential meeting, under the presidency of the Marquis of Exeter, was held in *the month of July* 1881, at the Hall of the

Fishmongers' Company, when resolutions were adopted to the effect:—That it was desirable to hold a Grand International Fisheries Exhibition in London in the year 1883; that a communication should be addressed to the Members of Her Majesty's Government, informing them of the proposal, and requesting their kind co-operation; that a Committee should be requested to draw up, at the termination of the Exhibition, a Report on the Fisheries of the British Empire and the best method of improving them; and that corresponding Committees should be formed round the coast. The Chairmanship of the Executive Committee was accepted by Mr. Birkbeck, and a Committee of twelve was formed representing the various fishery interests of the United Kingdom. Canada gave the services of Sir Alexander Galt; and the Marquis of Hamilton, upon whom, in conjunction with Mr. Birkbeck, the onus of the responsibility and the stress of the laborious daily executive work have fallen, was added to represent Ireland; while the Aquarium Department was placed under the management of Sir James Gibson Maitland; and the construction of the building was confided to the care of General Scott, whose recent decease is so greatly mourned at South Kensington. The buildings for the Exhibition, admirably adapted as they are for their respective uses, bear no slight testimony, were any needed, to General Scott's exceptional skill in architectural construction. Nor at the inauguration of this Great International enterprise will his colleagues fail to remember the high scientific attainments—the thoroughness of purpose and the endearing sweetness of disposition of him whose labours are ended.

A second important meeting was held at Willis's Rooms in February 1882, when the Duke of Richmond and Gordon read the Report of the Committee, and their Royal Highnesses the Prince of Wales and the Duke of Edinburgh expressed a strong interest in the undertaking. The support of Royalty was again readily granted for the scheme, Her Majesty graciously consenting to be Patron, and the Prince of Wales becoming President, while the Duke of Edinburgh, the Duke of Connaught, the Duke of Albany, and the Duke of Cambridge, accepted the position of Vice-Presidents, and the Duke of Richmond and Gordon that of Chairman of the General Committee. Of this Committee the Prime Minister

and Lord Granville are members, together with most of the Ministers of the present and late Administration. Every facility also was afforded by the various departments of the Government for forwarding the business of the Exhibition. Various means have been adopted to spread among the public a knowledge of the subject connected with this industry. Prizes are offered for the best exhibits as well as for the best essays upon selected and appropriate topics; Authorities of distinction have been invited to compile a series of popular Shilling Handbooks upon subjects with which they were specially acquainted, and Conferences are are arranged to be held during the continuance of the Exhibition for the discussion of important questions, the first of which will be held on the 12th of June, when a paper contributed by His Royal Highness the Duke of Edinburgh will be read. Nor is the practical side of the matter neglected. A fish market has been established within the precincts of the building, to which the great salesmen of our principal ports will send their wares direct. Arrangements, too, have been made for the supply of cheap fish dinners, under the able and experienced direction of Mrs. Clarke, the Lady Superintendent of the National School of Cookery, while lectures upon the treatment of fish will be given daily by an experienced instructress.

The sentiments animating the promoters will best be illustrated by certain words spoken by the Prince of Wales at the inaugural banquet at Norwich. "It is particularly gratifying," said His Royal Highness, "to see that at last an interest is being taken not only in our fisheries, but in our fishermen, whose lives are so frequently exposed to risk through the severity of weather and the dangerous character of the Eastern coast. Among a very interesting display of specimens, I especially observed the apparatus for saving life, and a variety of models of life-boats, which cannot fail to bring before the public generally their duty in regard to the protection of the fishing interests of our country. Whilst thinking over the probable results that may attend this Exhibition, I could not fail to reflect upon the labour it has cost more minds than one; and I do trust, having regard to the importance of our national fishing interest, and the value of our fishermen's lives, that a sort of National Society may be instituted

which will maintain those who are unfortunately in want, and help to assuage the grief and misery of the widows and orphans of those who perish at sea. I believe it is only necessary to throw out the hint to see established in this country a National Fishermen's Aid Society, which shall command the support not only of those living upon the line of our fishing coast here, but of all concerned in fishery throughout our dominions."

In these pregnant sentences, well befitting the Heir of the British Crown, are contained the whole force and design of the great Fisheries Exhibition, not merely as presented at Norwich but as developed in its International form in the present Exhibition at South Kensington. To this end the Exhibits, the Prizes, the Conferences, the Handbooks, the Market, the Cookery, the Dinners the Lectures, are all, in a systematic and carefully elaborated plan harmoniously directed. It is much to defend the natural wealth of our rivers and seas from the rapacity of greed and the recklessness of pollution; to provide improved harbour accommodation, and greater facilities for transport and commerce; to render the meals of the million more palatable, more wholesome, and, at the same time, more economical. But all these things sink into insignificance when compared with the safe-guarding of our fishermen's lives and the improvement of our fishermen's homes. These are objects in which all nations can cordially co-operate because all mankind is interested in the result; and in no way can our island kingdom more gracefully or beneficially exercise the historic pre-eminence conceded to her upon the seas than by promoting these interests in connection with such an enterprise as that of the International Fisheries Exhibition.

*7 May*, 1883.

# COMPLIMENTARY LIST.

**The Executive Committee is indebted to the following Firms for Special Services rendered; and for the Exhibits specified below, which have been courteously lent for the use of the Executive at the installation of the Exhibition, and throughout its term.**

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**ÆOLUS WATERSPRAY AND GENERAL VENTILATING COMPANY, Limited,** 235, High Holborn.

Downcast Ventilator.
Waterproof Downcast Shaft.
Single Horse Shoe Æolus.
Model of Section of Vessel with Æolus fitted.
Automatic Exhaust Ship Ventilator.
Small Models of Downcast and Upcast Ventilators.

**ATKINS WATER SOFTENING AND PURIFYING COMPANY,** 62 Fleet Street, London, E.C.

Apparatus for softening and purifying from 500 to 2000 gallons of water per hour, consisting of four parts, namely:

1st. Lime cylinder for the continual and automatic formation of lime water.
2nd. Patent mixer for mixing hard water supply and lime water.
3rd. Cistern in which softening process takes place.
4th. Patent Rotary disc Filter.

The especial points of this arrangement are perfectly uniform results and speed of cleaning filter by merely turning a handle or a pulley for a few minutes.

**BARNARD, BISHOP & BARNARDS,** Norwich; 91, 93, 95 Queen Victoria Street, London, E.C.

Ornamental cast-iron garden chairs; wrought-iron chairs and wood chairs suitable for conservatories, gardens, public and private buildings, exhibitions, railway platforms, &c.

Patented aquaria (exhibited on the stand of the Aylesbury Guano Company), and crab and lobster gauges (exhibited on the stand of S. W. T. J. Mann).

**BIRT, J. & A. W.,** Dock Street, London Docks, London, and Malaga, Spain.

The Virgin Cork (over 100 bales) used in the various decorations at this Exhibition. Messrs. J. and A. W. Birt's cork forests are in the province of Malaga, in Spain.

**BRIGHTON AQUARIUM COMPANY,** per J. Wilkinson, Manager and Secretary, Brighton.

In addition to placing seven of their tanks at the service of the Exhibition for receiving the deep-sea fish and crustacea from the trawler working for the Exhibition, have presented and arranged—

Sea Anemones, Actinoloba Dianthus, Sagartia Bellis, Sagartia Troglodytes, Sagartia Nivea, Sagartia Venusta, Sagartia Sphyrodeta, Sagartia Rosea, Anthea Cereas, Sagartia Parasitica, Sagartia Miniata, Lealia Crassicornis, Bunodes Gemacea, Corynactis Anquiconia Clavata, Serpulæ Sabella, Madrepores, Algæ—in sea-water tank No. 10.

Lent for Exhibition by the Brighton Aquarium Company—

A fine preserved specimen of the West Indian Turtle. Presented alive by Her Majesty the Queen, Aug. 1875.

Skeleton of Dolphin. Captured alive in Ryde Bay, Isle of Wight.

Skeleton of Grampus. Captured alive in the River Adur near Chichester.

**CAREY, HENRY WILLIAM,** 9 London Street, London, E.C.

Brewer's Patent Anti-friction Pulley Blocks, Cranes, &c. &c., supplied to the "P. & O. Co.," "Orient" "Donald Currie," "Ducal" and other leading lines of steamers, dock companies, Royal Agricultural Society of England, &c. Mr. H. W. Carey, of 9 London Street, City, sole agent for the above, rendered the Executive Committee most valuable assistance in the reception of goods into the building by the loan of these patent blocks, when the advantages obtained by their labour-saving and other properties, and easy working was practically demonstrated to the satisfaction of all concerned.

**CHUBB & SON'S LOCK AND SAFE COMPANY, Limited,** 128, Queen Victoria Street, London.

One of Chubb's patent Fire and Thief-resisting Safes, size 5 ft. 6 in. high by 4 ft. wide by 2 ft. 2 in. deep, on wheel mounts, fitted with all the recent improvements of the Company, solid tee frame and solid flange lock case and gunpowder-proof locks. Weight more than a ton and a half.

**CLOWES, WILLIAM, & SONS,** Limited, Duke Street, Stamford Street, London, S.E.

Printing Press, Compositors' Room, and services of staff of printers to undertake, in the Exhibition Buildings, printing for the Executive Committee, and for the Foreign and Colonial Commissions.

**COALBROOKDALE COMPANY, THE,** 43 & 44 Helborn Viaduct, London, E.C.

A Collection of Cast-iron Garden Embellishments and Horticulturul Decorations, consisting of—

**COALBROOKDALE COMPANY**—*continued.*

A large Fountain, surrounded by four Naiads, situated in the Main Hall, at the Exhibition Road end.

A number of Vases and Pedestals. A large number of Garden Seats and Benches in the building and grounds.

All of which are lent to the Committee, and will be for sale at the close of the Exhibition,

**CROSSE & BLACKWELL,** Soho Square, London.

Fish Sauces, condiments, &c., for use in the Practical School of Cookery and Cheap Fish Restaurant.

**DAVEY, PAXMAN, & CO.,** Engineers, Colchester.

The supply of engine and boiler power necessary for working the vast system of electric lighting throughout the whole area of the Exhibition has been provided by Messrs. Davey, Paxman, & Co., of Colchester, to whom the Committee, taking into consideration the immense extent of the buildings, and the enormous amount of horse-power required, desire to express their especial indebtedness. The engines, which are three in number, are of singularly beautiful construction, and their power is greater than that of any display of electric lighting which has yet taken place.

The principal of these engines is the largest which has yet been applied to the purposes of electric lighting.

It is a high pressure horizontal engine with two cylinders capable of indicating 350 horse-power, the pressure being 100 pounds steam. It is provided with Paxman's Patent Automatic Cut-off Gear worked from the governors, also two fly-wheels 12 feet in diameter turned in the face, each made to take a 15-inch belt.

The boilers for supplying steam to this engine are of locomotive type and of large size.

In addition to this engine, Messrs. Davey, Paxman, & Co. also supply a Double Cylinder Semi-fixed Engine and Boiler capable of indicating 90 horse-power, together with four other engines, one of which will be a compound capable of indicating considerably over 200 horse-power.

The vast amount of water required to supply the boilers, which generate steam for the engines, can best be realised when the fact is stated that the Committee have been compelled to lay down a separate 7-inch main, with a service of upwards of 100 pounds per square inch.

Thus, altogether, about 1000 horse-power will be required for lighting the many thousands of electric lamps with which the buildings of the Exhibition will be illuminated, and the Committee gladly avail themselves of this opportunity to express their sense of the good fortune they have experienced in securing a most interesting exhibit, and also

**DAVEY, PAXMAN, & CO.**—*continued.*

of obtaining, on merely nominal terms, so valuable and costly an assistance towards the success of the Exhibition.

**DAVIS, JOSEPH, & CO.,** Fitzroy Works, 6 Kennington Park Road, S.E.

Royal Polytechnic Barometer for use of Executive Committee.

Similar Barometers for public reference in various parts of the Exhibition Buildings.

Thermometers, Registering and others, for public use in the various Exhibition Buildings.

**DICK RADCLYFFE & CO.,** 128, 129 High Holborn.

In Aquarium Section—A Seapool arranged as a grotto, with effects, showing how electric light may be used to light up conservatories, &c.

In the Royal Pavilion—A Conservatory in Early English style, fitted up as a fernery, with roof decorated with creepers growing, and illustrating how natural foliage may be utilised in conjunction with the electric light, to illuminate conservatories, &c.

**DOBB, HENRY,** Draper and Outfitter, Westbourne Grove, W.

The characteristic costumes for the waitresses in the Fish Department.

**DROITWICH SALT COMPANY, Limited,** 8 and 9 Lower Thames Street, London, E.C.

Worcestershire table Salt.

" powdered Salt. For cooking purposes.

This salt is produced from the *oldest* and *purest* natural brine springs in the world, and is celebrated for its strength, purity in colour, and excellence of manufacture.

**FROST, EDWIN D.,** Hackbridge, Carshalton, Surrey.

A supply of live Wandle Trout during the time the Exhibition is open.

**GILES, B., & CO.,** Hot Water and Sanitary Engineers, Blackheath, S.E.

One No. 1 Giles' Patent Gas Cooking Stove, with Oven, 1 Boiler, 1 Steam Kettle, Hot Plate, and Hot Closet. The Gas is outside the oven, and will heat oven, boiler, and steam-kettle at a cost of 1*d.* per hour for gas.

One No. 2 Gas Cooking Stove, with 1 Oven, 1 Boiler, and Hot Plate with gas outside the oven.

Two Pastry Gas Ovens, with gas outside the oven.

One Large Gas Cooking Apparatus, with 2 Ovens, 1 Steam Boiler, 1 Hot Water Tank, 1 Steam Closet, and Hot Plate, with gas outside the oven.

Six National Training School of Cookery Gas Hot Plates.

Six International Gas, Fish, and Vegetable Steamers. This

**GILES, B., & CO.**—*continued.*

Steamer will cook a dinner for a large family at a cost of 1*d.* for gas.

Two International Gas Water Heaters.

This Heater will give a continuous supply of Hot Water at a cost of 2*d.* per hour for gas.

**GILLOW & CO.**, 406 Oxford Street, London.

Decoration and Furnishing of the Royal Pavilion by Messrs. Gillow & Co. It comprises a large

*Entrance Hall*, in the style of the Flemish Renaissance, the walls having panels, Tapestry with subjects of the Chase from the Royal Windsor Works, trophies of Arms, Italian Majolica and wrought-iron Chandelier with branches for the Electric lights. An opening through Tapestry portières leads to the *Study* fitted in the style of the Italian Certosina.

The *Dining Saloon*, of massive walnut, is hung with gold Venetian Tapestry, the coffered ceiling in wood having panels of bold ornament in blue and gold, the ceiling of the bay window is decorated with a figure of Venus rising from the sea. The furniture is of carved walnut of the Italian Cinque Cent. period, the seats covered with embossed velvets.

The *Boudoir* of H.R.H. the Princess of Wales adjoining is in the "Adam" style, with pilasters of maize-coloured silk, having enrichments in blue and gold. The furniture is of satinwood, with floral decoration, Amorini, &c. The doors, inlaid with various woods, have panels of cupids after Flaxman, in "bois sur bois" cameos. The fernery being on the right, and retiring rooms on the left of this apartment

THE OTHER FIRMS WHO HAVE CONTRIBUTED PRODUCTIONS TO THE ROYAL PAVILION ARE:—

THE ROYAL TAPESTRY WORKS, Windsor,—Tapestry.

THE ROYAL STAINED GLASS WORKS, Old Windsor,—Stained Glass.

H. B. DANIELL & SONS, Wigmore Street, — China and Glass.

ELKINGTON & Co., Regent Street,— Silver and Bronze Ornaments.

PERRY, New Bond Street, — Electroliers and Branches in Wrought Iron.

DICK RADCLYFFE, Holborn,—the Fernery completely fitted with Plants, &c.

DOULTON & Co., Lambeth, — Lavatories and Sanitary Fittings.

A. & F. PEARS,—Toilet requisites.

**GOODE, THOMAS, & CO.**, 17, 18 and 19 South Audley Street, London, W.

200 Dinner Plates. Ivory colour, mazarine blue aquarium subjects. Fish, reptiles, aquatic plants, &c. Presented for the workmen's and fishermen's dinners.

**MOORE, JOSIAH, & SONS**—*continued.*

In the windows of Arcade on right hand of Chief Entrance (near Fish Market) this firm have supplied and fixed some of their Patent Improved Glass Louvre Ventilators, by which the admission of air is diffused and is directed upwards, thus causing a continuous circulation of air. They can be regulated at pleasure to any degree by means of a very simple and efficacious arrangement worked by a single cord, and being made chiefly of glass no obstruction of light takes place. They can be made to any size, and are suitable for private houses, offices, warehouses, churches, halls, and public buildings generally.

**OSLER, F. & C.**, 100 Oxford Street, London, W., and Birmingham.

Have supplied at their own cost the Glass and China for the cheap fish dinners.

The pattern on the China has been specially designed. It is of a piscatorial character, suggesting the dinner from the fish to the weed, and is singularly appropriate. The initials "I. F. E." (impossible as a monogram) are dexterously intertwined in the folds of the weed.

This Firm also supplies for the Council Chamber a magnificent Electrolier, which is a work of art in cut glass and metal.

They have also decorated the Entrance Hall with a fountain in cut glass, fish-bowls, &c., together with combined fish and flower-bowls for the entrance to the Aquarium.

**PATENT VICTORIA STONE COMPANY**, 283A Kingsland Road. Works:—Stratford, Essex, and Grolly Quarries, Leicester.

The Entrance Hall and Fish Market are paved with the "Patent Victoria Stone," which has been extensively used as a footway-paving material in London and elsewhere during the last fifteen years. It is composed of fine particles of granite, mixed with the best Portland Cement, and afterwards immersed in a solution of Silicate of Soda, specially prepared under the Company's patented process.

**PRIMROSE & CO.**, Church Street, Sheffield.

Combined Conservatory and Aquarium, so constructed as to be easily removed in sections, glazed on patent Eclipse system with tin-lead bars. Dimensions, 14 ft. by 10 ft., with lantern and iron staging in centre, with aquarium and fountain.

**PULHAM, JAMES & SON**, Broxbourne, Herts.

"Rockifying" all the Fish Tanks in the Aquarium Corridor at less than cost price in the short space of eighteen days.

One of the two Cavernous Recesses, free of cost.

Decorating the Corridor with a variety of Art Flower Boxes

**PULHAM, JAMES, & SON**—*continued.*

Pots, Baskets, Vases, &c., by loan during the term of Exhibition free of cost.

Also of Vases, Tazze, &c., on various Piers about the Exhibition. Manufactured in their Red and Buff Terra Cotta.

**SHAND & MASON,** 75 Upper Ground Street, Blackfriars Road.

Have placed at the disposal of the Executive Committee for use, in case of fire, a number of their fire-extinguishing appliances, consisting of:—

One Improved Equilibrium Steam Fire Engine, fitted with their Patent Inclined Water Tube. Boiler capable of raising steam very speedily, such as they supply to Provincial Towns.

An Improved Manual Fire Engine, to be worked by 22 men, of the same pattern as made by them for the Metropolitan, London, and other Fire Brigades.

An Improved Curricle Engine, suitable for Villages and Private Estates.

A No. 3 Metallic Engine, suitable for Farms and Colonial use.

Ten Improved Corridor Fire Engines, and 10 London Brigade Portable Fire Pumps, as supplied to Her Majesty the Queen, His Royal Highness the Prince of Wales, and other members of the Royal Family, &c., &c.

Also an assortment of Chemical Fire Engines, Stand Pipes, Hose, Branch Pipes, &c., to be used in connection with the above engines, and the hydrants fixed in various parts of the grounds.

**SHIPWRECKED FISHERMEN'S AND MARINERS' SOCIETY.**

Fishermen's Home.

**SIEBE, GORMAN, & CO.,** 187 Westminster Bridge Road, S.E.

Diving Apparatus, Royal Navy pattern.

Diver working under water daily with a telephone attached to his helmet.

Submarine electric light.

Large oil painting, the "Raising of H.M.S. 'Eurydice.'"

Large collection of relics from the deep, some of which have been collected from the Spanish flagship "Almirante" of the Armada; and the "Mary Rose," lost in the reign of Henry VIII.; relics from the "Royal George;" ancient bronze lamp with sponge attached to same.

**SINCLAIR, JAMES,** 104 Leadenhall Street, London, E.C.

Ten No. 5 new patent Extincteurs, with three charges of chemicals and leather yokes each. Pedestals for standing same.

Two new "Express" 20-gallon Extincteurs on wheels, with hose reels and charge boxes.

**SINCLAIR, JAMES**—*continued.*

One "Village" Chemical Fire Engine, with two 20-gallon Extincteurs mounted on Wheels. Shafts for horse. Two splicing ladders, hose, buckets, lamps, &c.

One "Victor" Chemical Brigade Fire Engine, one 50-gallon Extincteur, two No. 5 Extincteurs. Mounted on four wheels, shafts and pole for horses, two splicing ladders, hose reel, charge box, buckets, hose, lamps, &c., complete.

One "Prince of Wales" combined Manual and Chemical Fire Engine, with four 4½-inch gun-metal pumps in wrought-iron tank, mounted on three wheels, delivery and suction hose, branch, &c.

Six Tyndall's Smoke Filter Respirators for breathing in dense smoke.

These celebrated Chemical Fire Engines have been supplied to the Admiralty and various Government offices; they are self-acting and always ready for action, one gallon of the chemicalized water being of greater extinguishing power than thirty gallons of ordinary water. The contents are harmless to life, health or property.

**SOLOMON, L. & A.**, 164 to 172 Queen Victoria Street, London, E.C.

Has supplied desks, washhand stands, looking glasses, &c., for use in the Cheap Fish Dining Department.

**STEVEN, BROTHERS., & CO.**, 35 Upper Thames Street, London.

Yacht, Boat, Steamer Cabin, Dumpy and Shop Stoves.

Milton Economic Portable Cooking Range.

Kitchener, with Steven Bros.' Patent Self-acting Cone Ventilator, which draws away the objectionable smells from the cooking of fish and vegetables into the chimney, thus removing the principal objection to close fire ranges.

Deck Pipes.

Barge Pumps.

Two Hundred Standards.

**TRELOAR & SONS**, 68, 69 & 70 Ludgate Hill.

Have given the door mats, made of cocoa-nut fibre, as they have done before to similar Exhibitions, and at the International Exhibitions in London and Paris.

**UNITE, JOHN**, 291 & 293 Edgware Road, London, W.

Practical assistance rendered in the supply of awnings, chairs, banners and other decorations. Also tent, and garden seats with awnings.

**WALSINGHAM, LORD**, Merton Hall, Thetford,

Has kindly placed the undermentioned live fish at the disposal of the Committee, viz.:

1000 golden tench; from 15 to 30 pike, of various sizes, say 4 lbs. to 20 lbs.; from 50 to 200 perch from ¼ lb. to 2 lbs.;

**WALSINGHAM, LORD**—*continued.*

from 50 to 200 tench (common) from 1 lb. to 5 lbs.; from 50 to 200 Rudd, some up to 2 lbs. at least; and some specimens of carp.

The golden tench are bred from the original stock introduced by Mr. George Duckett Berney, of Morton Hall, Norfolk, in the year 1852.

**WATERLOW & SONS, Limited, PHILIP H. WATERLOW** (Chairman), 26 Gt. Winchester Street, London, E.C.

The use of offices in the buildings of the Company as a City Office of the Exhibition, and the services of a portion of their staff without any charge.

**WOLFF, M.**

Refrigerator for use in cheap Fish Dining Room.

# ELECTRIC LIGHTING.

Appendix of Electric Lighting arrangements for the Exhibition, as laid down by different Firms and Companies,—each allotment of lighting space to any system being shown on the General Plan.

Further information may be obtained on application to Mr. W. D. Gooch, the Electrical Engineer for the Commissioners of the Exhibition, at his Office in the Annexe set apart for the Electric Light Machinery.

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**SWAN UNITED ELECTRIC LIGHT COMPANY,** 9 St. Mildred's Court, Poultry, E.C.

Royal Pavilion. This pavilion is lighted up with about 300 Swan incandescent lamps, high resistance, arranged in parallel series.

The effects of lighting attempted are various and specially arranged to demonstrate the adaptability of the incandescent lamp to decorative illumination.

The fittings are supplied by Messrs. Perry & Co., of New Bond Street.

The effect of lighting, by reflected light, the ceiling of the alcove in the dining room (Italian) is noticeable.

The Conservatory is lit by 60 half-lights, arranged to suit Messrs. Dick Radcliffe & Co.'s special class of conservatory fittings, and to give coloured and shaded light and water effects.

The dynamos used to feed the above lamps consist of alternating current dynamo with exciter, and a direct current dynamo, both on the Siemens system, and placed in the machine shed.

**GÜLCHER ELECTRIC LIGHT COMPANY, Limited,** Battersea Foundry, S.W.

East Gallery (China and Colonies), Machinery in motion and electric machinery sheds.

The Machine Annexe—4 Gülcher direct current low-tension dynamo machines, driving 600 "Crookes" incandescent lights in the China Gallery, and 30 arc lamps, also Gülcher system, in the machinery in motion and electric machinery sheds.

The tension of the current throughout does not exceed 70 volts, the lamps are arranged in parallel series upon numerous circuits running from the machines.

**SIEMENS BROS. & CO., Limited,** 12 Queen Anne's Gate, Westminster, S.W.

Conservatory, Main Gallery.

In Machine Shed—Two of their large size alternating current dynamo machines, fed by exciters, which give current for 1,200 Swan incandescent lights, lighting the Main Gallery. One large shunt-wound direct current dynamo, giving current to feed four large arc lamps in the Conservatory.

In Conservatory—Four 6,000 cp. arc lamps, Siemens system, for direct currents.

In Main Gallery—1,200 20 cp. Swan incandescent lamps, ordinary pattern, attached to the points of the girders. The illumination in this gallery is to demonstrate the possibility of lighting large areas by incandescent lighting.

**LEVER, CHARLES,** Culcheth Hall, Bowden, Cheshire.

Dining Rooms, Fish Dining Room, Lecture Theatre, Council Room.

In Machine Shed—Two Bürgin dynamo machines and two Gramme dynamos, direct current machines, each of these feeds seven arc lamps, Lever system. Distributed, two in Council Room, two in Lecture Theatre, three in Kitchens, and twenty-one in Dining Rooms; twenty-eight in all.

**ELECTRIC LIGHT SUPPLY COMPANY, Limited,** 28 York Street, S.W.

The Fish Market is lit by this Company with seven arc lamps (Volta) and sixty incandescent lamps, driven from two Frankland Bürgin dynamos in the Machine Room.

**ELPHINSTONE-VINCENT, MESSRS.,** Entrance Vestibule, Fine Arts Gallery, &c.—Lit 700 incandescent lights (Crooke's), driven by two Elphinstone-Vincent dynamo machines in the Machine Annexe.

**EDMUNDS, HENRY,** Victoria Mansions, Victoria Street, S.W.

The Promenade Gallery—Illuminated by fifty Hochhausen lamps, worked by two direct current H. H. dynamos in the Machine Room.

In the Western Corridor—Five hundred incandescent lamps, driven by two H. H. dynamos.

On the Upper Terrace a Light Tower, on the same plan as that in Madison Square, New York; carrying six large lamps of 12,000 cp. each, driven by H. H. dynamo. This tower is designed to light the whole of the Upper Terrace and Gardens.

**GÉRARD ELECTRIC LIGHT & POWER COMPANY, Limited,** Société Anonyme d'Electricité, Paris.

The galleries appropriated to Spain and Russia are lit by thirty-six arc lamps on the Gérard system, actuated by Siemens' alternating current dynamos in the Machine Room.

**FERRANTI, THOMPSON & INCE,** 3 Fenchurch Avenue, E.C.

In the Aquarium—One thousand incandescent lamps, Swan type, deriving current from one machine (Ferranti), and twenty arc lights of high candle power (5500), lighting the Quadrants and Great Britain Western Gallery.

In the Machine Room—Two Ferranti-Thompson dynamos, excited by Siemens' direct current machines, and serving: one, 1000 incandescent lamps, the other, twenty large arc lights.

**BRITISH ELECTRIC LIGHT COMPANY,** Turk's Head Yard, E.C.

The Central Transepts (Norway and Sweden)—Sixteen arc lamps (Brockie), driven by Gramme dynamo machines in the Machine Annexe.

**ELECTRICAL POWER AND LIGHT CONTRACT AGENCY,** 71 Bishopsgate Street Within, E.C.

Fifteen arc lamps (Lea system), lighting the West Central Transept (Canada and United States); and six Werdermann lamps, lighting the Board of Trade Shed.

In Machine Shed—Four Gramme dynamos, with two exciters, each exciter actuating two dynamos.

**JABLOCHKOFF ELECTRIC LIGHT & POWER COMPANY, Limited,** 1 Great Winchester Street Buildings.

Main Central Gallery (Netherlands, Norway, Sweden, Canada, &c.)—Sixty Jablochkoff single-candle lamps, worked by three Jablochkoff Gramme self-exciting alternating-current dynamos in Machine Shed.

**MATHIESEN, R.**—Pavilion Corridor and Shipwrecked Mariners.—Six Mathiesen arc lamps, supplied by 3 Matthiesen dynamos.

**GOULARD & GIBBS, MESSRS.**

These gentlemen demonstrate their system of inductive distribution of electric energy by secondary generators, placed upon one continuous primary circuit in many parts of the building, the generators at the different sites doing work of a totally diverse character, such as arc lighting, incandescent lighting, charging accumulators, and working motors. Their primary dynamo machines are placed in a special shed adjoining Machine Room, and are of a compound Gramme type.

# FINE ARTS.

## OIL PAINTINGS.

**** Further pictures have been promised, and will be found referred to in the Second Edition of the Catalogue—in which also the rotation numbers of all the Works of Art will appear.*

[All communications respecting the purchase or sale of pictures should be addressed to Mr. C. W. Deschamps, 1A Old Bond St. W.]

**ALFRED, H. J.**, 20 Moorgate Street, E.C.
Not Caught Yet. Price £4 4s.
Anxious Enquiries. Price £4 4s.
Won by a Head. Price £4 4s.
Life's Sunset. Price £4 4s.
"Foul." Price £4 4s.
The Rise. Price £4 4s.
Set of Miniatures; episodes of salmon fishing. Price £26 5s.
Set of Miniatures of Fish. Price £26 5s.
Thames Trout; in season and out of season. Price £50.

**ANSDELL, RICHARD, R.A.**, Lytham House, Kensington.
Fifty years ago; before the Salmon Act.

**ARTZ, D. A. C.**
"A Dutch Fisherman at Home." Price £63.
A Fisherman's Wife (Holland). Price £63.

**ASHE, J. W. L.**, Heathside, Bexley Heath.
A Rough Day on the Cornish Coast. Price £52 10s.
A Nook on the Cornish Coast. Price £21.

**BAKER, F. W.**, 115 Belsize Road, Abbey Road, N.W.
"A Cornish Fisherman's Home." Price £7 7s.

**BANNATYNE, J. J.**, 5 Albert Street, Regent's Park.
"A Highland Salmon River." Price £35.
(*See Water Colours.*)

**BARTLETT, W. H.**, Park Lodge, Church Street, Chelsea.
"Return from the Seal Hunt." Lent by J. Brown, Esq.

**BELSHAW, FRANK**, 13 Sherwin Street, Nottingham.
"Just Caught." Price £16 16s.

**BIRD, C.**, 106 High Street, Lowestoft.
Fishing Boats leaving Lowestoft Harbour. Price £42.

**BISHOP, W. R.**, 5 Union Square, Islington, N.
Salmon, Trout, Perch, Chub, and Dace. } Price £27 10s. the pair.
Jack, Dace, and Roach. }

**BLOGG, MRS., NELLIE**, 5 Mount View Villas, Crouch Hill Hornsey.
"Soldier and Sailor." £4 4s.

**BRÉANSKI, GUSTAVE DE,** Cookham, Berks.
"Fishing-boats making for Whitby Harbour." Price £55.

**BROCKETT, W.** (the late), of Boston, U.S.A.
The Rise. Lent by R. Potter, Esq.
The Leap. " "
The Struggle. " "
Landed. " "

**BROOKS, THOMAS,** 3 St. Helen's Terrace, Alexandra Park, Hastings.
"Fishing Cobles running for shelter, Runswick, Yorkshire." Price £157 10s.
"Lynmouth, North Devon, Life-boat going to the rescue." Price £157 10s.

**BROOME.**
Ramsgate Life-boat, "The Bradford," proceeding to the rescue of the crew of the "Indian Chief," on January 5th, 1881. Lent by W. H. Bacon, Esq.
"Return of the Life-boat." " "

**BROWNING, ROBERT BARRETT,** 19 Warwick Cresent, W.
A Stall in the fish market at Antwerp.

**CAFFIN, W. W.**
Lent by Alfred G. Jardine, E .—
Eel Bucks on the river Kenett. Price £20.
The Angling Friends. Price £20.

**CALLCOTT, W. I.,** 48 Flanders Road, Bedford Park, Chiswick, W.
"Herring Smacks Arriving:" Gorlestone, Great Yarmouth. Price £250.

**CAMERON, HUGH, R.S.A.,** 22 West Cromwell Road, S.W.
"Anxiously Waiting." Lent by Adam L. Cochrane, Esq.

**CLARK, JOSEPH,** 396 Camden Road, N.W.
"The Fisherman's Family." Price £63.

**CLAY, SIR ARTHUR, BART.,** Burrows Lea, Gomshall, Surrey.
"Mending Nets." Price £31 10s.
"The Fisherman's Boy." £63.

**COX, FRANK E.,** 5 John Street, Bedford Row, W.C.
"Baiting the Lobster Pots." Price £42.

**COOPER, DAVIS,** 103 Gower Street, W.C.
Sea Trout Fishing. Price £21.
Loch Fishing. Price £21.

**COOPER, A. W.,** 7 Manor Road, Twickenham.
Hampshire Trout. Price £30.
(*See Water Colours.*)

**COLLINSON, R.,** 20 Hereford Square, South Kensington.
Crab Pots, Isle of Wight. Price £100.

**CRAFT, PERCY R.**, Stanmore Lodge, Penge Lane, Sydenham, S.E.
"Last of the Oyster Boats, Port Eynon, South Wales. Price £12 12s.
"The Smack-Yard in Chancery, Shoreham." Price £12 12s.
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"An Afternoon on the Beach." Price £12 12s.
"Watching the Fishing Fleet." Price £21.
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**CULLIN, J. R.**, 18 Warwick Gardens, Kensington, W.
Salmon and Trout. Price £30.
Perch, &c. Price £40.

**EDWARDS, EDWIN** (the late), care of Mrs. Edwards, 26 Golden Square.
By the Salmon breeding boxes, Sunbury-on-Thames. Price £35.
Pilchard Fishing, Mullion Cove. Price £35.

**ERSKINE, NICOL., A.R.A.**, 24 Dawson Place, W.
Storm at Sea. Lent by E. Priestman, Esq.
"Steady, Johnnie!" Lent by David P. McEuan, Esq.
"Il Piscatore." Lent by Mr. L. H. Lefevre.

**FARREN, R. T.**, Cambridge.
"Chub from the Ouse, Cambridge." Lent by W. Farren, Esq.
Perch and Bream from the Ouse. " "

**FENNELL, GREVILLE.**
Glen Sannox, Isle of Arran. Lent by T. R. Sachs, Esq.

**FISHER, DAN.**, Wheeler Street, Witley, Surrey.
"Landing Herrings at Whitby." Price £68 5s.

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"Hooked at Last." Price £20.

**FORSTER, C.**
A Catastrophe (after Bateman). Lent by T. R. Sachs, Esq.
A Brace of Trout (after Rolfe). " "

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Shetland Herring Boats. Price £30.

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Lent by Joseph Grego, Esq.—
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Group of Freshwater Fish.
Freshwater Fish and Nets.

**GRAHAM, T.,** Stanhope Yard, Delancey Street, N.W.
"Oh, the clang of the Wooden Shoon." Lent by Mrs. Stewart.

**GRIFFITHS, TOM,** 31 Rochester Road, N.
Oyster Beds, Mumbles, Swansea; Early Morning. Price £60.

**HAWKSLEY, ARTHUR,** 2 Queen's Road Studio, St. John's Wood.
Departure of Leigh Shrimping Boats. Price £40.

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Dutch Fishing Pinks returning from Sea. Katwyke Beach, Holland. Price £400.
"Life-boat." Lent by Sir Matthew White Ridley, Bart., M.P.

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"A Boulogne Fish Wife." Price £7 7s.
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The Morning Catch. Lent by W. B. Waterlow, Esq.

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"Through the Sparkling Waves." Price £50.
(*See Water Colours.*)

**HENDERSON, J.,** 227 Hope Street, Glasgow.
"Fishing-Boats at Anchor, Sound of Kilbramen." Price £126.

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"Salt Water Fisherman."

**HOLLOWAY, C. E.,** 36 Gloster Road, Regent's Park.
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"A Cornish Fishing Village." Price £52 10s.
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(*See Water Colours.*)

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"Salmon Fishermen Emptying a Fly-Net, Aberdeen Beach."

**HUNTER, COLIN**, 14 Melbury Road, Kensington.
"The Silver of the Sea."
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"The Poor of the Village." Lent by G. Webster, Esq.
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The Yachting Party. " "
"For these and all your mercies." " "

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A Bordighera Fisherman. Price £5 5s.
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"A Mussel Gatherer." Price £27 10s.

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"Canal Fishers." Price £21.

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"Landing Herrings, Morning in the Old Harbour, Greenock." Price £52 10s.

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"Calm Reflections." Price £94 10s.

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French Fishing Boats, Hâvre.
(*See Water Colours.*)

**MILES, T. R.**, Camden Road Studios, N.W.
"Galway Fish Market." Price £250.
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"A Life-boat." Lent by Henry Tate, Esq.
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Price £35.

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**POCOCK, L. L.,** 12 Warwick Road, Maida Vale.
"The Seine Net." Price £20.

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**RAINEY, W.,** 12 New Court, Lincoln's Inn.
"The Two Pollys." Price £30.
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**RAWLE, J. S.,** 155 Great Titchfield Street, W.
Boats in the Bay of Beer, South Devon. Price £15.

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"Grig Weels." Lent by H. J. Stiles, Esq.

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**ROLFE, H. L.** (the late).
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Christchurch Salmon. Price £52 10s.
Group of Pike. Price £21.
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"A Shrimper, Normandy." Price £52 10s.

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"Homes of the Fisher-folk, St. Mawes, near Falmouth." Price £30.

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"Drawing the Herring Nets." Lent by A. Rose, Esq.

**BAILEY, H.,** 14 Cunningham Place, St. John's Wood.
"A Fishing Village, Cornwall." Price £12 12s.

**BANNATYNE, J. J.,** 5 Albert Street, Regent's Park.
A Highland Trout Stream. Price £20. (*See Oil Paintings.*)

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South Sea Whaling. Lent by C. E. Fry, Esq. Price £300.

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"A Storm, Moonlight." Price £15 15s.

**CLACK, THOS.**, Vernon Lodge, Wellesley Road, Turnham Green, Gunnersbury.
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**COOPER, A. W.**, 7 Manor Road, Twickenham.
Trout, Roach, Chub and Grayling. Price, £40.
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**COWPER, R.**, 3 The Residences, South Kensington Museum.
The Fishing Quarter, Hastings. Price £6 6s.

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Fisherman and Children, Whitby. Price £6 6s.

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A Fisherman's Garden. Price £42.
Fishing-boats at Low Tide. Price £21.

**HUME, E.**, South Harting, Petersfield.
Dutch: "The Silvered Stream." Price £30.
(*See Oil Paintings.*)

**HUNT, A. A.**, Blackheath Park.
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**ISRAELS, JOSEPH**, The Hague, Holland.
The Happy Family. Lent by J. S. Forbes, Esq.
(*See Oil Paintings.*)

**JOPLING, J. M.**, 28 Beaufort Street, Chelsea.
Mending Nets, St. Monan's, Fife. Price £42.

**LAWRENCE, W. T.**, 26 Old Compton Street, Soho.
"Barbel and Perch." Price £2 2s.
"Isaac Walton's House, Fleet Street."

**LEWIS, C. J.**, Cheyne House, Chelsea.
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(*See Oil Paintings.*)

**MACULLOCH, JAMES**, 9 Harrington Square.
Hooked at Last.—Auchnahool Burn. Price £26 5s.

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Fishing boats returning, wind freshening, Lowestoft. Price £52 10s.
(*See Oil Paintings.*)

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A Venetian Fishing-Boat. Price £5 5s.

**QUINTON, A.,** 12 New Court, Lincoln's Inn.
"Drying the Sails, Polperro Cornwall." Price £15 15s.
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**REID, A. D.,** St. Luke, Kepplestone, Aberdeen.
"The Herring Harvest." Price £45.

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Salmon—"Leap for Liberty." " " Price £10.
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"Fishing-Boats at Exmouth, Devon." Price £30.

**SEVERN, WALTER,** 9 Earl's Court Square, W.
Seals, Cormorants and Gulls fishing off the north coast of Cornwall. Price £55.

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"The Survivors." Price £100.

**SPIERS R. PHÉNÉ,** Carlton Chambers, 12 Regent Street, W.
"Fishing-Boats and Net Huts, Hastings Beach." Price £7 7s.
"Scheveningen Fishing-Boats." Price £7 7s.
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**STOCKS, W. F.**, 192 Haverstock Hill.
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Price £31 1

**THORNELEY C.**, Hastings House, The Park, Highgate.
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"The First Lesson." Lent by A. Mannooch, E
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Off the Worm Head, bound against tide. Price £
(*See Oil Paintings.*)

**WALTON, F.**, Holmsbury St. Mary, Dorking.
"The Crabbers," Penberth Cove, Cornwall. Price £18 1

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A North Sea Fishing-Village. Price £
(*See Oil Paintings.*)

**WYLLIE, W. L.**, 70 Carlton Hill, N.W.
Arabs fishing, at Alexandria. Price £26
(*See Oil Paintings.*)

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# GREAT BRITAIN.

THE

# FISHERIES MAP OF THE BRITISH ISL

ESIGNED AND COMPILED BY

W. M. ADAMS, B.A.,

FORMERLY FELLOW OF NEW COLLEGE, OXFORD, AUTHOR OF "THE SHILLING CA
NAUTICAL ASTRONOMY," AND INVENTOR OF THE CELOMETER.

UNDER THE SUPERINTENDENCE OF

E. W. HOLDSWORTH, F.L.S., &c.,

AUTHOR OF "DEEP SEA FISHING,"
AND SECRETARY TO THE ROYAL FISHERIES COMMISSION OF 1863.

*Published on behalf of the Executive Committee of the Interna*
*Fisheries Exhibition.*

THE Fisheries Map of the British Islands is designed to illustrat
commerce of the United Kingdom in relation to fish, and the distrib
of the principal kinds around the coast. That portion of it which de
relative amount received by the ports and conveyed inland, by the
roads, is classified in three divisions with reference to each of these
classification being based upon returns presented to the House of
July, 1882. For the purposes of illustration, the following system c
is adopted. First, with reference to the relative amounts of fish rec
different ports of the United Kingdom during the year 1881.

Ports receiving annually—

Under 1,000 tons (inclusive) are represented thus *Margate.*
Over 1,000 and under 10,000 (inclusive) tons *TYNEMOU*
Over 10,000 tons .. .. .. .. .. YARMO

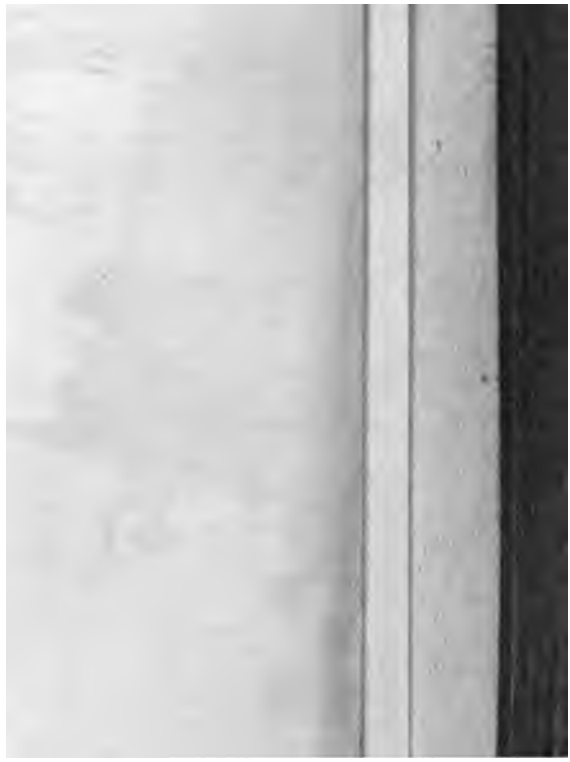
Ports averaging less than one ton a week are not inserted in the n

With regard to the railways, a similar principle of classificati
adopted, except that the distinctions are made upon a somewhat lar

Railroads conveying annually—

Under 10,000 tons (inclusive) are delineated thus ..
Over 10,000 and under 50,000 (inclusive), thus ..
Over 50,000 tons, thus .. .. .. .. ..

The part of the map which relates to the fisheries, exhibits appro
distribution of oysters on the different parts of the coast and the diff
for herring and mackerel respectively, together with the times
salmon ascend and descend some of our principal rivers; these illust
derived from the best available authorities. To each fish is ass
tinctively shaped enclosure, the circle ○ to herrings, the triangle △
the square □ to salmon, and the oval ⬭ to oysters, the name of the
season being inscribed within the enclosures. Measures are in prog
direct information from various parts of the coast as to the duratio
season for several kinds of fish, the fishing grounds chiefly frequent
of each port, and the seasons best suited for the various fisheries.
edition of the map is in course of preparation, to be published se
the catalogue, which will exhibit these additional particulars and
increased number of kinds of fish. It will indicate also the rel
of water-borne fish forwarded from each port, the towns containin
homes and aid societies, and those which possess fish-curing establ
manufactories for fish products; the localities where fish markets
ence, or where it is considered desirable by the Corporation of t
they should be erected; the bays suitable for breeding groun
particulars calculated to advance the interests of fisheries and fishe



# GREAT BRITAIN.

## Sea Fishing.

Under this head is included everything immediately relating to and connected with the actual working of all kinds of fishing. The class has been naturally and conveniently divided into two sections—sea fishing and freshwater fishing; and it is to the more important section of sea fishing that attention will first be directed.

The wide importance of the sea fisheries will be perhaps better understood when the variety of objects now brought together before the public have been examined, and it is observed how many trades must be kept at work, and how much knowledge in various forms is required to provide the fisherman with the apparently simple means of carrying on his daily occupation of catching fish. The demand for sea fish is constantly increasing. This naturally leads to greater enterprise among the fishermen; and capital, in the majority of cases the accumulated savings from years of hard work at the fisheries, is invested in additional boats and gear for the further development of an industry which, laborious as it is, yet rarely fails to bring a more or less profitable return to all who are concerned in it. The special increase of fishing during recent years has been, however, in the deep sea, and nothing has been more remarkable in this respect than the rapid growth of beam-trawling, especially in the North Sea, where a great extent of suitable ground is always available. It is from this vast field and by the method of fishing known as "beam-trawling" that the London and country markets are mainly supplied with turbot, brill, and soles among "prime" fish, and thousands of tons of plaice, haddock, and other common fish are obtained and distributed at low prices among the poorer classes throughout the country. The peculiar construction of the beam-trawl will well repay examination, and some idea will be obtained of the manner in which such large numbers of fish are taken whilst the net is being silently towed over the ground, entirely out of sight of the fishermen.

Second only in importance to the trawl is the drift-net, the method by which mackerel, herrings, and pilchards are principally captured. In this case we have nets which are in general use all round our coasts, and employed at long as well as at moderate distances from the land. As their name implies, "drift-nets" require plenty of room, for they are carried wherever the tide may drift them during the few hours they are left in the water; and their simple character will be readily understood from the numerous specimens exhibited, differing but little in general appearance except in the size of the mesh, which is adapted to the

kind of fish intended to be taken. Few people who are not fishermen have any idea of the hundreds or even thousands of miles of net which almost nightly in the regular fishing seasons float like long walls or barriers in the sea to intercept and mesh the shoals of fish as they gradually draw in towards the coast. The drift fisheries are altogether a very important industry, both to ourselves and those countries bordering on the North Sea and the Channel, and in Scotland the drift herring fishery is looked forward to as the most valuable harvest. Besides the nets already mentioned, many other varieties will be found abundantly represented; among them the gigantic funnel-shaped stow-net, by which thousands of tons of sprats are caught every winter at the mouth of the Thames and other places on the south coast of England and the sean, seine, or sweep-net (the ancient *Sagena*) the oldest form of net of which we have any distinct record. More universal in its use than nets, and of particular importance for the capture of certain kinds of fish, line fishing must always possess a great deal of interest. It represents probably the earliest method of fishing, and fish hooks of some description, and often of the roughest kind, have been found in use among the most uncivilized people met with by early navigators. Line fishing in this country is extensively carried on for the capture especially of cod, ling, haddock and whiting, and hooked fish of these kinds usually command a higher price than those caught in the trawl as their delicacy is not impaired by the knocking about to which they are subjected when massed together among the varied and often crowded contents of the beam-trawl. The various plans adopted in different countries for fitting out the special gear for the capture of particular kinds of fish both by hand-line and long line are well represented, and no doubt may be studied with advantage.

Objects of special interest will be found in the numerous models of, [illegible] designs for, the boats and vessels in which the fisheries are carried on. [illegible] increasing tendency in recent times to fish at long distances from the land [illegible] to remain at sea for even many weeks at a time, has led to a marked change [illegible] the character of the fishing vessels employed, and has induced builders to [illegible] the advantages of greater size and improved designs in the construction [illegible] vessels capable of facing the bad weather to which they are sure sooner or [illegible] to be exposed. Even in the smaller boats more commonly employed in [illegible] fishing, the advantage of their being decked is daily bee[illegible] evid[illegible] they can stand worse weather and therefore can [illegible] to [illegible] seeking the shoals of fish where formerly the[illegible] The [illegible] important improvement, howe[illegible] the em[illegible] ment of steam power; a[illegible] the addi[illegible] expense incurred in[illegible] [illegible]rtial ad[illegible] Its advantage [illegible] to go [illegible] return quick[illegible] and lab[illegible] hauling th[illegible] [illegible]awling, whe[illegible] steam [illegible] make the [illegible] their [illegible] as a partial [illegible] sti[illegible] or securing [illegible] d[illegible] steam to fishing [illegible] put taken in the [illegible] [illegible]ter of so many [illegible] more elaborate ap[illegible] [illegible]ermen of little more [illegible] [illegible]ything on a larger [illegible]

they find the [illegible]
stans, [illegible]
easily, and [illegible]
exposed [illegible]

The [illegible]
ever, [illegible]
coast [illegible]
they have [illegible]
fishing [illegible]
distress might [illegible]
attempting [illegible]
failed to properly [illegible]
rocks, and perish [illegible]
harbours for fishing [illegible]
with this subject [illegible]
entrance to harbour [illegible]

Life-boats and life-[illegible]
have but little to do [illegible]
The large scale [illegible]
work necessary for [illegible]
kinds of weather, [illegible]
of some of the [illegible]
belonging to the [illegible]
and, like sailors [illegible]
as implying a [illegible]
ever rarely [illegible]
system which [illegible]
display of [illegible]
interest now [illegible]
attention is [illegible]
ships or [illegible]
signalling; [illegible]
under [illegible]
working of [illegible]
food [illegible]

[illegible]ons used
[illegible] other mode
[illegible]nes, hooks,

[illegible] positions in the
[illegible]dex (page 224)
[illegible]ar branches of

[illegible]ntrance to the

[illegible]orest Road,

[illegible]ates, Hull.

[illegible]n, &c.

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[illegible]atting, &c.

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*** The Plan *which faces the Title-page shows generally in what positions in the Main Buildings the various Divisions may be found. The Subject Index (page 224) groups together, for the advantage of those interested in particular branches of manufacture, the specific exhibits.*

*The rotation numbers commence on the left hand at the main entrance to the British Deep Sea Fisheries Gallery.*

1. **DAVIS, FREDERICK,** 5 Wentworth Terrace, Forest Road, Nottingham.
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6. **MORRIS, C. W.,** Harbour View, Lowestoft.
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Trawl Net, with improved cod end to allow immature fish to escape.
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Autumn Herring Net, for longshore fishing.
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**MORRIS, C. W.**—*continued.*

shrimp trawls, and small bow net in centre, which is continually hauled so as to ascertain whether there are shrimps on the ground being passed over; in the event of the ground being void of shrimps the larger nets are hauled and the ground retraced. Scale 1 in. to the foot.

Model of Shrimp Boat, as used where there is no harbour, and have to be worked from the beach, ballast dischargeable when coming ashore. Scale 1 in. to the foot.

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Muzzle-loading Harpoon Gun.
Harpoon, with fixed flukes.
Patent Breech-loading Bomb Lance Gun.
Bomb Lance (empty).
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One ditto ditto highly finished.
One ditto ditto with self-cocking action.
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2 Double C. F. Guns (one in case).

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19. **PATERSON, WILLIAM,** 5 High Shore, Macduff, N.B.
Collection of Long Line Gear, complete.

20. **BROOKS, C. & R.,** 10 Edgcumbe Street, Stonehouse, Plymouth.
Handlines, Long Lines, and Artificial Sea Baits, &c. The Handlines and Long Lines are for the use of Yachtsmen, with railing, Lines for Mackerel, and Horsehair Drift Lines for Bass. Together with all kinds of Light Gear for Boat-fishing.

21. **TARRY MILL COMPANY,** per John Muckart, Tarry Mill, by Arbroath, N.B.
Collection of Long Lines, Hand Lines and Snooding. Collection of long line gear complete.

22. **MURRAY, ALEXANDER,** Fisherman, Lossiemouth, Morayshire.
Basket for containing baited fishing line.

23. **ROSS, JOHN, Jun.,** Muchalls, near Stonehaven.
Fishing Lines, as used by the fishermen on the "Finnan Coast" of Kincardineshire.

24. **WATSON, ALEXANDER,** 26 Skene Street, Macduff, N.B.
Collection of Long Lines, Hand Lines and Snooding.

25. **EDINBURGH, H.R.H. THE DUKE OF, K.G.,** Clarence House, St. James's, London.
One Net Trammel, Silk, 60 yards.
One Net Trammel, Twine, 85 yards.

25*a*. **WEST, JAMES,** 31 Crook o' Ness Street, Macduff, N.B.
Dandy Hand Line, complete.

26. **HOUNSELL, HERBERT E., Limited,** Pelican Twine and Net Works, Bridport, Dorset.
Patterns of Fishing Lines and Twines.
Patterns of Netting and whole Nets—complete, for Sea Fishing
Models of Fish Traps.

27. **ROUTLEDGE, W., & SON,** 219 Gallowgate, Aberdeen.
General assortment of Fishing Gear. All hand-made.

**CHARLES LANCASTER,**
INVENTOR OF
**THE NON-FOULING SMOOTH OVAL-BORE FOR ALL KINDS OF RIFLES.**
INVENTOR AND PATENTEE OF
**THE FOUR-BARREL BREECH-LOADING HAMMERLESS GUNS, RIFLES, & PISTOLS.**
**Detailed Price Lists on application.**
**151 NEW BOND STREET, LONDON, W.**

**HOUNSELL, WILLIAM, & CO.**, North Mills, Bridport.
Nets, Lines, and Twines for Sea Fishing.

**BUIK, J. H., & CO.**, South Rope Works, Wick.
Herring Nets and Fishing Lines.

**JONES, W.**, 10 Eastbro, Scarborough.
Case of Sea Fishing Tackle, Rods, Reels, Lines, Hooks, Baits, &c., &c. Special Sea Rod, with Improved Wheel Tops.
Case of Fitting for Herring Nets and Boats, Nozzles, Head Seam, Net Rope, Lashings and Barrel Strops, Lead Lines, &c.
Case of Twines for Trawl and other Nets, with Lead Lines, &c., &c.
Model Blocks, Dead Eyes, Trucks, &c.
Case of Lines used in Deep Sea Fishing, Cod Lines, Haddock, Sole and Whiting Lines, with Hooks, &c., complete. Also Hand Lines and Hooks, complete.
Model of an improved Trawl Net, showing how the Net will allow small and immature fish to escape, also refuse.
Model of an improved Herring Net.

**MACKAY, ANDREW**, 8 Crook o' Ness Street, Macduff, N.B.
One Herring Net complete, ready for sea.

**CORNWALL—REPRESENTATIVE EXHIBITS FROM.**
Nets, Lines, Lobster Pots, and Gear of every description.

**IRVING, WILLIAM**, Loch Fishery, Annan, N.B.
Model of Stake Net.

**READ, GEORGE**, Byrom House, St. Patrick's Road, Deal, Kent.
Trawl Net, Stow Net, Trawl Shrimp Net, to allow immature fish and refuse to escape therefrom, by a very simple and inexpensive method. With improved gear for boarding the Stow Net and Shrimp Net.
Model of a Sailing Trawler.
Self-acting Helm Signals (awarded £200 by Admiralty).
Diagrams, framed and glazed, to illustrate signals for ships, tidal harbours, pierheads, and dockheads.
Flash Lights for Fishermen to communicate their wants on shore or afloat to Steam Carriers, &c.
Signalling by day or night for fishing fleets and vessels.

ANDERSON, ABBOTT, & ANDERSON,
*MAKERS OF*
*FISHERMEN'S OILSKIN CLOTHING*
OF EVERY DESCRIPTION.
37, Queen Victoria Street, London, E.C.
WORKS: LIMEHOUSE, E.

35. **FINDLAY, GEORGE,** Whitehills, Banff, Scotland.
Herring Net hung according to rule, so that every mesh is a uniform square (with plan).
Long-Line for Haddock Fishing.
Lobster and Crab Pot, allowing the undersized to escape.

36. **FLETT, JAMES,** Queen Street, Branderburgh, Morayshire.
Herring Net, trimmed.

37. **WILSON, HENRY,** 32 Southside Street, Plymouth.
Two sets of Td. Manilla Bridles.
Td. Manilla Dandy Span.
Td. Manilla Net Warp.
Td. Russian Net Warp.
Set of Trawl Twine.
One Td. Manilla Trawl Rhode, large yarn, hard laid as used in the West of England.
One Td. Manilla Trawl Rhode, finer yarn.
Td. Manilla Rope.
Wh. Manilla Cordage.
Two Coils Wh. Manilla Cordage (fine).
Td. Russian Cordage (fine).
Bolt Rope.
Td. Russian Rope.

38. **SHEPHERD, H. C. W.,** Hull House, Raglan Street, Lowestoft.
Model Deep-Sea Trawl Net, with beam and heads complete, with Apparatus to denote when Net has turned over.
Model Boat for carrying fish from catcher to carrier.

39. **MAIR, GEORGE,** Commerce Street, Branderburg, Morayshire.
Fishing Line Basket.

40. **PITCHELL, W.,**
Nets.

41. **BEESON, WILLIAM L.,** 78 Sterling Street, New Clee, Grimsby.
Model of Deep Sea Trawling Gear on an improved scale.

42. **THOMPSON, PETER,** 9 High Shore, Macduff, N.B.
Collection of Long Line Gear Complete.
Model of Drifter for Herring Fisheries.

43. **DAVIDSON, GEORGE & WILLIAM,** 18 Regent Quay, Aberdeen.
Model—White Fishing Beam Trawl Net.
Samples of Net Twines made of Hemp, Cotton, and Flax.
Samples of Fishing Lines.
Cordage for Nets.

Stop at **BAKER STREET STATION** for

**MADAME TUSSAUD & SONS' EXHIBITION.**

**Admission 1s. Extra Rooms, 6d. Open from 10 till 10.**

**OOD, JAMES,** Fishcurer, Cullen, N.B.
Nets and Lines used in Moray Firth.

**ICHARDSON & FLETCHER,** 5 Beresford Place, Dublin.
Herring-net Floats for Scotch Fishery.
Herring-net Floats for Irish Fishery.
Mackerel-net Floats.
Pilchard-net Floats.
Salmon-net Floats.
Hake-net Floats.
Floats chemically prepared to resist the action of the water.
Corkwood as raw material for Floats.

**ATERSON, ANDREW,** 6 High Shore, Macduff, N.B.
Mackerel Line, complete.
"Murderer" for catching Codfish.
Hand Trap for catching Crabs and Lobsters at foot of rocks.

**ESLIE, JOHN,** Ropeworks, Macduff.
Collection of Long Lines, Hand Lines, and Snooding.

**AVIDSON, R.**
Nets.

**EMMING, T., & SON,** Windsor Mills, Redditch.
Lines, Hooks, &c.

**RNOLD, JOHN WILLIAM,** 9 Park Street, Deal.
Mackerel Net.
Herring Net.
Sprat Net.
Trammel Net.
Hand Line for Whiting Fishing.
Lug Fork as used in this locality for digging large Lugworms used as a favourite Bait for Whiting, Pouting, Codfish, &c.
Cockle Rake used by the small boys in gathering Cockles, Clams, &c., at low water time in this neighbourhood.

**ONES, JOHN,** Queen Street, Filey, Yorks.
Sample Balls of Head Seam for Herring Nets, in Russian Hemp, Manilla, and Cotton.
Nozzles for Herring Nets, in Manilla and Cotton.
Lead Lines. Lead and Log Lines.

**G. SAMSON AND SON,**
**ENGINEERS AND IRONFOUNDERS,**
**MAKERS OF FISHING NETS AND TWINE-MAKING MACHINERY.**
**GROVE IRON WORKS,**
**BRIDPORT, DORSET, ENGLAND.**

**JONES, JOHN**—*continued.*
Hand-Spun Cod Lines.
Smaller size for Haddock.
Line for Sole Catching by Hooks.
Tow or Mooring for Lines.
Samples of Snooding for the above Lines in Hemp and Cotton.
Hand Lines.
Sample Coils of Rope for Herring Nets.
Sample Coils of Rope for Net Lashings and Strops.
Manilla and other Twines for Crab and Lobster Pots.
A Lobster and Crab Pot complete.

52. **FORDYCE, JOHN**, Gardenstown, Banffshire.
One Greatline placed in a basket about 24 in. diam., and from 12 to 18 in. deep. The Hooks and Strings placed in the basket in the same position as is adopted by the fishermen on the North-East Coast of Scotland in the capture of Cod and Ling.

53. **LINTON, ANDREW**, 87 High Street, Edinburgh.
Cork Net Floats for all fishing purposes.

54. **WORTLEY, COLONEL STUART**, Rosslyn House, Grove End Road, and Patent Museum, South Kensington.
Various Fish Hooks, Spears, and Floats, from the islands in the Pacific Ocean. Brought home by Exhibitor, who has had most of them in use.

55. **BUCHANAN, JAMES**, 58 to 62 Dale Street, Tradeston, Glasgow.
Sea Fish Hooks for Home and Foreign use; also, as agent for S. Laycock & Son, Sheffield.
Long Dressed Hair for Fishing purposes.

56. **STEEDMAN & McALLISTER**, Cathcart Street, Glasgow.
A Number of Fishing Floats for Long Lines, &c.
Cork Fenders for Fishing Boats in Hemp.
Cork Fenders for Fishing Boats in Manilla Rope.
Cork Fenders for Fishing Boats in Coir Rope.

57. **SHARP & MURRAY**, Cellardyke, Fifeshire.
Collection of Herring Nets, complete, as used on the British Coast.
Collection of Bowls, Buoys, and Bladders, for Drift or Surface Fishing.

EWENS AND TURNER,
**BRIDPORT, DORSET.**
MANUFACTURERS OF
*Hemp and Cotton Fishing Nets;*
*Cod, Caplin and Herring Seines, Fishing Lines, Twines, etc.*

**SHARP & MURRAY**—*continued.*

Collection of Deep-Sea Fishing Gear, complete for Cod, Ling, Halibut, Haddock, &c., with Sculls and Maunds used for same.

Collection of Hand Line Gear, complete.

Crab and Lobster Pot.

**JONES, CAPTAIN A. J.,** 2 Sandown Terrace, Chester.

Two Coracle Nets.

Trammel Net.

Mussel Dredge.

Two Coracles.

Model of Dee Fishing Boat.

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## DIVISION II.

**Oyster dredges, crab, lobster, prawn, &c. pots, and other appliances for catching fish of this description.**

. **SOFTLEY, R. T.,** Central Works, King Street, Great Yarmouth.

Improved folding Crab and Lobster Trap.

0. **DONALDSON, ROBERT,** 5 Quay, Dumbarton, N.B.

Full Model of Decked Fishing Boat, from light-water draught, Lug Sail which does not require to be dipped, and showing Mainsail and Staysail in one. Length, 42 ft. keel, 10 ft. beam. Scale 1 in. to the foot.

Model of Open Fishing Boat, complete. Length, 26 ft. keel, 6 ft. beam. Scale ½ in. to the foot.

Model of Punt, ½ in. to the foot.

Model of Cot, ½ in. to the foot.

61. **PLUMMER, LEWIS,** Mast Yard, Sandside, Scarborough.

An improved Crab or Lobster Pot, made so as to allow small or undersized crabs to escape, and can be baited from either top or bottom, and requires no weight to sink it.

62. **LEVACK, DONALD,** Aukengill, by Wick, Caithness, N.B.

One Lobster Pot.

63. **DAMON, ROBERT,** 4 Pultney, Weymouth.

Improved dredge for Mollusca, &c.

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Valuable Companion for every Visitor to the Fisheries Exhibition.

IN MONTHLY PARTS, Price 7D.,

**THE FISHERIES OF THE WORLD,**

*Being an Illustrated and Descriptive Record of the International Fisheries Exhibition.*

*** PROSPECTUSES AT ALL BOOKSELLERS' POST-FREE FROM THE PUBLISHERS.

CASSELL & COMPANY, Limited, Ludgate Hill, London.

64. **ARNOLD, JOHN WILLIAM,** 9 Park Street, Deal.
Prawn and Lobster Net.
Model Shrimping Boat, showing how four shrimp nets are worked.

65. **ASCROFT, ROBERT LAMB,** 17 Barratt Street, Southport.
Hand Shrimp Net.
Shank Net or Shrimp Net, to be used from a boat.
Model Shrimping Boat, showing how four shrimp nets are worked.

66. **HURD, RICHARD,** 6 York Buildings, Eastbourne, Sussex.
Prawn Nets.

67. **RITCHIE, WILLIAM,** 9 Mid Street, Rosehearty, Aberdeenshire.
Lobster Pot, made by Exhibitor.

68. **SAUNDERS, GEORGE,** Fisherman, Selsey, Chichester.
An improved Lobster Pot, so constructed as to permit the small lobsters to escape.
An improved Prawn Pot.
The above articles are constructed partly of willow, and partly of galvanised wire, and are specimens of pots which have been actually used by Exhibitor.

69. **PERRIN, CHARLES,** Selsey, near Chichester, Sussex.
Withy Prawn Pots.

70. **PATERSON, GEORGE,** 4 Market Street, Macduff, N.B.
Crab or Lobster Pot, model, new design.

71. **KING, GEORGE HOADLEY,** Sea-Horse House, 165 Great Portland Street, London.
A Folding Dredge, also a portable folding Washing Tray for the use of gentlemen dredging.

72. **EDWARDS, J.,**
Lobster Pots, &c.

73. **THOMAS, J. J., & CO.,** 87 Queen Victoria Street; 285 & 362 Edgware Road, London, W.
Galvanized Wire Lobster and Crab Pots.
Galvanized Wire Prawn Pots.

74. **THOMSON, WILLIAM,** 8 Lowshore, Macduff, N.B.
Crab and Lobster Pot or Creel.

**ANDERSON, ABBOTT, & ANDERSON'S**
**FISHING STOCKINGS**
**ARE GUARANTEED ABSOLUTELY WATERPROOF.**
37, Queen Victoria Street, London, E.C.

**WATT, CHARLES, Jun.**, Pennan, Fraserburgh, N.B.
Lobster Pot or Trap.

**SCHREIBER, CARL G. VON**, St. Margaret's College, Lowestoft.
Lobster and Crab Pot, permitting the escape of those undersized.
Model of a Life-saving Apparatus and Sea-Chest.

**MASSEY, J. H.**,

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## DIVISION III.

### Steam fishing vessels and steam carriers.

**LESLIE, GEORGE**, Shipbuilder, Dundee, N.B.
Half Model and Plan of Steam and Sailing Herring and Line Fishing Vessel "Seagull" of Dundee, with builder's Patent Lifting Propeller.
Full-rigged model of Steam and Sailing Herring and Line Fishing and Trawling Smack, for inshore fishing. With builder's Patent Lifting Screw.
Full-rigged Model of a Well Steam and Sailing Smack, for line and trawling deep sea fishing. Lifting Propeller.
Model and Plan of Screw Steam Tug for towing and trawling in bad weather.

**SIMS & TOOZES**, 10 Park Street, Hull.
Full Model of a Deep Sea Trawler, 85 tons, with Trawl complete, and fitted with Steam Capstan in working order.
Models and Drawings of Steam Fishing Vessels and Carriers under 5 HP.
Full Model of a Steam Screw Trawler and Carrier.

**BEAVOR-WEBB, J.** (N. A.), R. T. Y. C., 7 Albemarle Street, London, W.
Model of Steam Trawler, 95 ft. L. W. L.
Model of Steam Carrier, 120 ft. L. W. L.
Model of Herring Boat.

**HAWTHORNS & CO.**, Leith, N.B.
Case containing Models.
Half Model of Iron Screw Trawlers, length 92 ft., breadth 18 ft., depth 9½ feet, for the General Steam Fishing Company.

**HAWTHORNS & CO.**—*continued.*

Half Model of Iron Screw Steamer for carrying cured herrings in barrels, length 82½ feet, breadth 18 feet, depth 9¼ feet.

Half Model (Iron) of Screw Tug, length 70 ft., breadth 15 feet, depth 8½ feet.

All fitted with compound surface condensing Engines.

82. **BRITANNIA STEAM SHIPPING COMPANY, Limited,** John Wyvill, Manager, 4 Princess Terrace, Scarborough.

Model and Half-model of a Steam Trawler.

83. **BROWN, ALFRED H., A.I.N.A.,** Naval Architect, 1 Waterloo Place, Pall Mall, London, S.W.

Half Model of Steam Trawler and Carrier, combined on Back Board. Also Lines of the same, in frame, glazed.

84. **JONES, E. PERCY S.,** Rother Iron Works Company, Limited, Rye, Sussex.

Model of Steam Trawler.

85. **METAXA, COUNT AND COUNTESS,** 9 Norwood Terrace, Southend.

Model of Steam Trawler.

Model of Ship, Ivory Yards, &c., made in India.

86. **FELLOWS, H., & SON,** Great Yarmouth.

Half-model of Steam Fishing Vessel.

Plan of Steam Fishing Vessel.

87. **MARKS, WILLIAM,** 6 Highbury Quadrant, Highbury New Park, London, N.

Steam Fishing Vessel.

This Vessel, owing to its many air-tight revolving rollers, is of sufficient buoyancy to admit railway trucks on deck for the convenience of packing Fish. It also has large reservoirs for preserving the Fish alive. The proposed breadth is 100 feet, and length 200 feet.

Steam Life-boat. Constructed not only to save life, but from its great buoyancy (obtained by the many revolving air-tight rollers acting as propellors), will help to support a ship from sinking and tow same into port. The Life-boat contains large space for salvage, &c., also when at anchor could serve as a revolving lightship.

**ANDERSON, ABBOTT, & ANDERSON'S**
FISHING BROGUES
**Are Unsurpassed.**
37, Queen Victoria Street, London, E.C.

**SWINBURNE, THOMAS A.**, Eilan, Shona-Sala, Ardgour, N.B.

Model of Fishing Lugger, with Auxiliary Screw. adapted for Drift-Net, Long Line, or Trawl; Masts to lower; Balance Lugs; Capstan and Windlass to be worked by Steam.

Model of Improved Yawl for Line or Drift-Net Fishing, Masts to lower, Balance Lugs, Light Draught with Centre Board.

Model of Fishing Boat for East Coast, Scotland, Improved Rig, Balance Lugs.

Model of Improved Mule Coble for Herring Fishery, Cleaver Centre board, Triangular Balance Lug.

Patent Anchors (2 Brass Models).

**BEECHING, BROTHERS,** Ship and Boat Builders, Great Yarmouth.

Boat for conveying Fish from the catcher to the carrier, adapted for preserving the lives of the crew.

Model of Trawling Smack, Dandy Rigged, without Fishing Gear.

**ROSS & DUNCAN,** Engineers and Shipbuilders, Whitefield Works, Govan, Glasgow.

Photograph of Engines of Steam Trawler.

(A.) This shows the style of Engine best suited for vessels of somewhat narrow beam, as the condenser tubes, when they are removed, are drawn out in the fore and aft direction.

Ditto, Improved Type, with Direct-acting Pumps.

(B.) These Engines have very few working joints, all the pumps being worked direct. This saves wear and tear and attention. Somewhat greater width of beam is required than in the (A) arrangement.

Ditto, Latest Type, Duncan's Patent, reversing by a valve.

(C.) These Engines are of the greatest possible simplicity, and can be worked without skilled labour. Instead of having link-motion or other complicated gear, the reversing is done by valve. They have only one eccentric instead of four, and fifteen fewer working joints than (A) or (B). They are specially adapted for small craft.

Duncan's Patent Propeller.

The Blades of these Propellers are formed by a combination of curves designed to give great forward thrust. They are of special efficiency where there is extra resistance to the motion of the vessel.

ANDERSON, ABBOTT, & ANDERSON,
INDIARUBBER & OILSKIN CLOTHING
Works: Limehouse, London E. **MANUFACTURERS.** 37, Queen Victoria St. London, E.C.
SEE SAMPLES IN EXHIBITION.

90a. **SIMPSON & DENISONS**, Engineers, Dartmouth, S. Devon.
Twenty-one feet Yacht's Fishing Launch, convertible into Four-oared Gig, fitted with Kingdon's Patent Machinery.
Twenty-one feet Four-oared Fishing Gig, convertible into Steam Launch.
Compound Surface Condensing Engines (Kingdon's Patent), and Natural Draught, Vertical Boiler (Kingdon's Patent), with Simpson and Denisons' Patent Feed and Air-pumps for the above.

91. **GRIFFITHS, ROBERT**, 54 Gresham Street, London, E.C.
Models of Sterns of Screw Ships, on stand, showing arrangement for protecting the Propeller of Screw Steam Trawlers, which has been applied to the "Sir Charles Whetham" tug at Milford with very satisfactory results, and will be used by the National Fishery Company, and also methods of increasing the speed of Screw Carriers.

92. **JARVIS, W.**, Ship and Boat Builder, Anstruther, N.B.
Steam Trawlers and Fishing Vessels; also Fishing Vessels other than steam.

93. **ALLAN, D., & CO.**, Shipbuilders, Granton, near Edinburgh.
Collections of Models of Steam Fishing Vessels, shewing modes of first successful Fishing Steamers in Scotland and in Spain, and Model which gained the Gold Medal at Edinburgh Fisheries Exhibition in 1882.

94. **BLAKE, A. W. & HERBERT P.**, Great Yarmouth and Lytton Road, Leytonstone, London, E.
A Half-model of a Steam Screw Trawler, 75 ft. × 19 ft. × 11 ft., adapted for the North Sea or other fishing. In designing, the object kept in view has been upon minimum dimensions to secure maximum results, among the advantages of a small boat we have, 1st. Moderate original cost, 2nd. Adaptability to small harbours, 3rd. Low working expenses.
Descriptive Drawing of the above, showing Elevation, Deck Plan, Plan of Hold, Engines and Boilers, &c.
Sail Plan of the above.

95. **WOODYER, HENRY L.**, 9 Hadd's Terrace, Scarborough, Yorks.
Full-rigged model of Screw Steam Trawler and Carrying Vessel.

ANDERSON, ABBOTT & ANDERSON'S
PATENT HYGIENIC VENTILATED
WATERPROOF COATS.
37, Queen Victoria St., London, England.

96. **INGRAM, R.**, Brock Farm Cottage, North Shields.
Working Model of a proposed Screw Steam Trawler, built of Polished Zinc and Plated, fitted with Engine and Boiler, 105 ft. on Load Line, 112 ft. 6 in. over all, Beam moulded 20 ft., depth 11 ft. 6 in., Scale ¼ in. to 1 foot. Illustrating a means of securing solid water for the Propeller to work in, and effectual guarding from fouling the Trawl and Tow Line, and no hindrance to the speed of the Steamer.

## Division IV.

### Fishing vessels, and boats other than steam vessels.

**** From considerations affecting the apportionment of space, it has been found necessary to include in the British Deep Sea Fisheries Gallery, containing, among other Divisions, Division IV., also boats used for Fresh-water Fishing. (Division XX.)*

97. **IRVINE, FRANCIS**, 14 Skene Street, Macduff, N.B.
Four Models Full Rigged.
The "R. W. Duff" with Sweeping Mast and Screw Propeller, driven by hand; capstan, with safety rail; can be used in section, simple, efficient, and cost little.
"Alexn Asher" Smack Rig with Sweeping Mast and safety rail, entirely out of the way when down, new design of Steering Gear.
"Macduff" new build, with new design of Rig, the Sail does not require to be dipped in beating to windward, possessing the advantages of the Lug Sail without the dangers of it.
"W. E. Gladstone" Trawler or Fish Carrier, the openings on Deck are for stowing the Fish into the different compartments.

98. **HODGSON, J. W.**, 48 Redbourne Street, Hull.
Complete Model of Trawl Fishing Vessel, built and fitted up strictly on a scale of ½-in. to 1 ft. Dimensions 80 ft. by 20 ft. by 10 ft. Showing Fish-room, Engine-room, and arrangement for working capstan by Steam power, &c.

CHAINS, CABLES, ANCHORS, GRAPNELS, HARPOONS,
AND EVERY DESCRIPTION OF
SHIPPING TACKLE AND BOAT IRONWORK, WOOD AND IRON BLOCKS AND WINDLASSES.
TOMPSON AND CO.,
*PATTERN ROOM:* 4, BROAD STREET BUILDINGS, E.C.
(*Facing Broad Street Station*); and DDULEY.
IMPORTERS OF AMERICAN ASH BOAT OARS SHIP LAMPS.

99. **HOAD, JAMES C., JUN.**, Rye, Sussex.
Model of the North Sea Trawler, "City of London," of Hull, by ¾ in. scale. Launched February, 1883.

100. **PETERKIN, J. C. & CO.**, Rope and Sail Makers, Lossiemouth, Elgin.
Zulu Boat, rigged with Sails.

101. **BANKS, GEORGE,** 1 Henrietta Court, St. Thomas Street, Scarborough.
Model of a North Sea Trawler, complete, fitted up inside, with Cabin, Fish Room, Ice Room, Warp Locker, and all requisites, &c., complete.

102. **ROSHER, CHARLES HENRY,** 23 Fulham Park Gardens, London, S.W.
Eskimo Kayak (canoe), Paddle, Boathook, Seal-harpoon and line.
Sealskin boots and mittens.
The frame of the Kayak is constructed of wood fastened with thin strips of hide and sinews, and it is covered with sealskin, sewn with reindeer sinews. The head of the harpoon is made from a walrus tooth, and the line of walrus-hide.

103. **FROST, C.**
Models of Boats.

105. **YOUNG, SIR ALLEN,** 5 St. James Street, London, W.
A Sledge and Boat, with travelling equipment for long journeys over the ice, as supplied to the relief ship "Hope."

106. **ROPER, RICHARD,** 143 Lewisham High Road, New Cross, S.E.
Fishing Punt, with fluted bottom, built on the cellular (unsinkable) principle, suitable for rivers, lakes, &c., fitted with cabins for sleeping, cooking, &c., and tanks to hold fish. Scale, 1 inch to 1 foot.
Fishing Punt, on the same principle, without cabins; suitable for small lakes, small ponds, &c.; fitted with tanks for fish, lockers, and umbrella tent, and seats. Scale, 1 inch to 1 foot.

The Best and Cheapest. First Established 1825.
NEAVE'S FOOD FOR INFANTS AND INVALIDS.
IN ONE-POUND ONE SHILLING CANISTERS.
SOLD EVERYWHERE. WHOLESALE OF THE MANUFACTURERS,
J. R. NEAVE & Co., Fordingbridge, England.

7. **SHARP AND MURRAY,** Cellardyke, Fifeshire, N.B.
Models.

8. **METCALF & WOOD,** Albert Dock Locks, Hull.
Complete Model 80-Ton Sailing Trawler, fitted up with all the latest improvements, fishing gear, &c.
"Boat," 17 ft. long 7 ft. beam, for conveying fish from the smack to the steam cutters.

9. **LEIGH-SMITH, R.,** 64 Gower Street, London.
Boat of the late Yacht "Eira," in which Exhibitor retreated to the Coast of Nova Zembla, after wintering in Franz Joseph Land, and rescued by the "Hope." Distance traversed, about 800 miles, chiefly through pack ice. Time occupied on journey, 43 days.

10. **SKINNER, J., & SON,** Wellington Street, Aberdeen.
Models.

11. **ANDERSON, ABBOT, & ANDERSON,** 37 Queen Victoria Street, London.
Portable India Rubber Boats.

12. **JEANS, JOHN,** 65 Blair Street, London, Poplar, E.
Model of Life-boat, "Torry Burn." Propelled by Screw. Length 30 in.
Model of Ship's Pinnace, "Wind Jamer of Aberdeen," to go by Windmill, utilising the wind, thus ensuring the safety of lives when launched from ship. Length 30 inches.

Model of Herring Boat, "Betty Allen of Foot Dee." Propelled by screw when required. Length 30 inches.

13. **BAXTER, ALFRED,** Fish Docks, Grimsby.
Boat for Cod-Fishing Vessel.

14. **CORDING, GEORGE,** 125 Regent Street, and 231 Strand, London.
India Rubber Portable Boat for Lake Fishing, &c.
Portable Collapsible Boat.

15. **BEECHING, BROTHERS,** Ship and Boat Builders, Great Yarmouth.
Full-Sized Boats.

**ANDERSON, ABBOTT, & ANDERSON,**
PATENTEES AND SOLE MANUFACTURERS OF THE
REGULATION MILITARY VALISE.
Horse Guards, *June* 12, 1871.
Messrs. Anderson, Abbott, & Anderson,—The Valise made by your firm has been found well suited for the conditions proposed, viz., to enable an officer to carry the articles absolutely required for service; and the waterproof sheet answers as a bed; the whole, fittings included, not exceeding forty pounds weight. The pattern has been deposited at the Horse Guards for inspection.
ARTHUR HERBERT, A.A.G., Col.
**37, QUEEN VICTORIA STREET, E.C., LONDON, ENGLAND.**

116. **BURDETT-COUTTS, W.**, 1 Stratton Street, Piccadilly, London, W.
A Greencastle Yawl, used for fishing off part of the coast of County Donegal, fully rigged, 24 ft. by 7 ft.

117. **HAMILTON, THE MARQUIS OF**, 2 Belgrave Square, London, W.
A Tory Island (co. Donegal) Curragh, used in fishing, full size, 15 ft. by 5 ft.
A Dunfanaghy (co. Donegal) Curragh, used in fishing, full size, 15 ft. by 5 ft.
Long Line and Mackerel Hand Line, as used in Sheephaven Bay, County Donegal.

118. **SAYER, J. W.**, 4 Lower Thames Street, London, E.
A Kerry Curragh, used off counties Clare and Kerry, in fishing, fully rigged, 28 ft. by 7 ft.
A Gweedone Curragh, used in fishing, full size, 15 ft. by 5 ft.
A Boyne Corracle, used on river Boyne in Salmon fishing, full size, 4 ft. by 4 ft.

119. **STEPHEN, WILLIAM, & SONS**, Shipbuilders, Marine Parade, Dundee, and St. John's, Newfoundland.
Whaleboat, fully equipped with guns, lances, &c., ready for use.

120. **MUNDAHL, C. M.**, Fish Docks, Grimsby.
Codman's Boat.
Whelker's Boat.

121. **JOHNSON, FRANK C.**, 10 Lyle Street, Greenock.
Half-model of 46-ton Sailing Trawler, 64-ft. Keel, 18-ft. Beam, 9 ft. depth of Hold.

122. **WRIGHT, J. P.**, Bank of England, London, E.C.
Collapsible Dinghy, cork and wood sides, canvas waterproof bottom, protected by an outer bottom of wood.
Folding Canadian Canoe, cork and wood as above.
Folding Inflatable Canoe. Weight 25 lb. Size, open, 7 ft. 6 in. by 30 in.; folded, 28 in. by 14 in. by 9 in.
Folding Shooting and Fishing Punt, 15 ft. by 3 ft. 6 in.; folding to, 6 ft. long.
Ditto, 10 ft. by 3 ft.; folding to, 5 ft. long.

ANDERSON, ABBOTT, AND ANDERSON,
PATENTEES & SOLE MANUFACTURERS OF THE REGULATION WATERPROOF CLOAK.

HORSE GUARDS, 10th March, 1871.

GENTLEMEN,
The Waterproof Coat made by you has been approved of as a pattern for Coats to be worn in wet weather by all officers.—The Material seems excellent, and it exactly what was recommended by the Committee. Your pattern has been now sealed and deposited at the Horse Guards.—I am, Gentlemen, yours obediently, ARTHUR HERBERT, A.A.G., Col.—N.B.—A General Order on the subject will be issued in next month's orders.

G. O. 28. OFFICERS' DRESS.

A Waterproof Cloak has been approved of for Officers on duty in wet weather. The pattern has been sealed and deposited at the Horse Guards. It is optional with Officers to provide themselves with this Cloak; but no other Waterproof Overcoat is to be worn on duty.

37, QUEEN VICTORIA STREET, E.C., LONDON, ENGLAND.

**BERTHON BOAT COMPANY, Limited,** Works, Romsey, Hampshire, London office, 72 Aldersgate Street, E.C.

Collapsible Insubmergible Dingheys for Fishing Smacks, which, being stowed in so small a space, afford a means of refuge in case of distress. This Dinghey is 12 ft. long by 4 ft. 2 in., but it can be made of any size and in any form. It will live in any sea, and will not sink when filled with water.

Collapsible Boats for Fishing and Shooting on Rivers and Lakes.

Collapsible Boats, 7, 9, and 10 ft. long, for Fishing, Shooting, &c. The 10 ft. boat is bipartite, or made in two parts for more convenient transport, one half being carried on each side of a pony.

Canoes for Paddling, Sailing, and Duck Shooting.

A 22-ft. Berthon Lifeboat collapsed between davits on a ship's side, showing how any amount of the very best and safest boats can be carried by any ship without inconvenience. These are unrivalled sea boats, and excellent sailers. They open automatically in a few seconds, and are far less liable to injury in the act of lowering than common boats.

**MEITER, C. W., & CO.,** 87 Gracechurch Street, London, E.C.

Fishing, Shooting, Pleasure, Life-Saving Portable Boats.

Unsinkable Waterproof Fishing Garments, and other Life-Saving Appliances.

**WOODHOUSE, HENRY,** Bridge Street, Maidenhead, Berks.

Fishing Punt.

Fishing Boat.

**WISEMAN, FREDERICK,** Paglesham, Rochford, Essex.

Model of Dredging Boat for Oysters.

**FELLOWS, H., & SON,** Great Yarmouth, Norfolk.

Plan of Sailing Trawler and Carrier.

**METCALF & WOOD,** Albert Dock, Hull.

Model of an 80-ton Sailing Trawler, with complete outfit and gear. Scale, one inch to the foot, everything to scale.

**SHIPWRECKED FISHERMEN'S AND MARINERS' ROYAL BENEVOLENT SOCIETY,** Hibernian Chambers, London Bridge, S.E.

Frames with Testimonials, Forms, &c.

Annual and Quarterly Publications.

Serial issues and Pamphlets.

Gold, Silver and other medals.

"Grace Darling" Boat, as memorably used by that heroine (6 Sept. 1838). Lent by *Mrs. John Joicey.*

**SHIPWRECKED FISHERMEN'S AND MARINERS' ROYAL BENEVOLENT SOCIETY**—*continued.*

Series of Photographs of rescued vessels, exemplifying terrible effects of numerous notable collisions. Lent by Fletcher, Son, & Fearnall.

130. **ALBERT DOCK SHIPWRIGHT, BOAT BUILDING, AND MAST AND BLOCK-MAKING CO., Limited, HULL,** George F. Stevens, Manager.

Deep-Sea Trawler's Boat for conveying Fish from Catcher to Cutter.

131. **GUNN, JOHN,** The Hermitage, Golspie, Sutherlandshire.

Model of deck portion of fishing-boats, showing model of guard rails for fishing-boats and other vessels. This rail is to be fitted inside the gunwale or rail of boats, &c., and is made to fold down and appear as if there was no rail.

132. **SEARLE & SONS,** Stangate, Lambeth, London, S.E.

A River Fishing Punt.
A River Fishing Gig.
A River Skiff-headed Fishing Punt.

133. **MESSUME, E., & SONS,** Lansdowne Boat House, Lower Road, Richmond, Surrey.

A Mahogany Fishing Punt.
A Mahogany Lake Punt, suitable for rowing or fishing.
An Oak Fishing Gig.
"Specialité" Pleasure Skiff, fitted with nickel silver fittings and all the Exhibitors' latest improvements.

134. **SAUNDERS, SAMUEL EDGAR,** Streatley, Berks.

Thames Fishing Punt, not more than 26 feet long, and 4 feet beam.

135. **EDINBURGH, H.R.H. THE DUKE OF, K.G.,** Clarence House, St. James's, London, S.W.

Carved Figure-Head of a Canoe. This object belonged to the late chief Porutu te Takataka of the Ngatiawa tribe, Wellington; and was presented to H.R.H. Duke of Edinburgh by his son Ihaia Poruru. It was carved by the well-known Wiremu Kingi, the chief who began the war (New Zealand) in 1860.

**ANDERSON, ABBOTT, & ANDERSON'S**
PORTABLE FOLDING
BATHS.
PORTABLE REGULATION BUCKETS AND BASINS.
WATERPROOF
KIT AND CLOTHES BAGS.
37, QUEEN VICTORIA ST., LONDON, E.C.

6. **HARTNEY, MICHAEL,** Castlegregory, Co. Kerry.
Kerry Corracle or Canoe, with fittings, eight Paddles for four hands, two Lugsails, and three Leeboards, newly invented and made by Exhibitor. It is well adapted for safety on the sea in rough weather, and for fast sailing. Also for deep-sea fishing purposes; mackerel, herring, pilchard, long-line and hand-line fishing; hauling for salmon, trout, flat fish, and for lobster. It is serviceable also for pilot purposes, and for saving life and property when larger boats could not succeed. Also for safety to and from the beach through heavy breakers.

7. **TYZACK, B. C.,** 13 Preston Road, North Shields.
Boat, Fish Carrier Model.
Ships Navigable Buoy, Life-Boat Model.

8. **KEW, T. J.,**
Models.

9. **LEE & WIGHT,** Boatbuilders, &c., Tweedmouth, Berwick-on-Tweed.
A Deep-Sea Fishing Boat, Full Rigged.
A Coble Round Stern, as used on the East Coast.
An Angling Boat, as used on the Tweed.
A deep-sea Fishing Boat.
Angling Boat and Coble.

10. **WEATHERHEAD, JAMES,** Eyemouth, Berwickshire.
Model of Fishing Boat "Waverley;" length, 52 ft.; breadth, 17 ft.; height, 8 ft. 8 in.; awarded First Prize at Yarmouth Exhibition.
Model of Fishing Boat.

11. **SHARPE, BENJAMIN J. P.,** Commander Royal Navy, Hanwell Park, Middlesex, W.
Boat best adapted for conveying fish from the catcher to the carrier. This Boat is from its self-righting and undestructible properties thoroughly adapted for deep-sea fishing in the heaviest weather.
Boat with Superior Rig, having a Lug Sail cut with two luffs, the one as usual from the fore-end of the yard, the other commencing at the slings. The forepart of the sail having sheets which set as a foresail in tacking, and the whole can be simultaneously lowered by letting go the halyards.

**Elastic Stockings, Knee Caps, &c., give great support in cases of Weakness, Varicose Veins, and Sprains.**

**ANDERSON, ABBOTT, and ANDERSON'S**

**Ice Bags, for the Head and Spine.**

**Waterproof Bed Sheeting, Travelling Conveniences, Syringes, Accouchement Sheets, Belts, and Braces.**

142. **WALLIS, WHITWORTH,** 4 The Residences, South Kensington Museum, London, S.W.
Model of Fishing Smack.

143. **NOBLE, JOSEPH,** Seaman, 38 Castel Street, Fraserburgh, Aberdeenshire.
Model of Fishing Boat.

144. **BISHOP, S.,** Fernbank Road, Redland, Bristol.
Model of a "Guernsey" Mackerel Fishing Boat. Scale 1 in. to 1 ft., built by Exhibitor.

145. **FINDLAY, GEORGE,** Whitehills, Banff, N.B.
Models of Fishing Boats used on the North East Coast of Scotland.

146. **KEYMER, H. J. C.,** The Fisheries Iron Works, Great Yarmouth.
Model of Boat not less than 45 ft. Keel.
Model of off-shore Boat, with or without steam.
Model of Steam Herring and other Fishing Boat or Vessel.

147. **SKINNER, JOHN & SON,** Boatbuilders, Wellington Street, Aberdeen.
Herring Fishery Boat.

148. **"THE COMPANY OF FREE FISHERS AND DREDGERS OF WHITSTABLE, IN THE COUNTY OF KENT,"** known as "*Whitstable Oyster Company.*"
Model of Dredging Boat.
Dredges and other Appliances used in Oyster Fishery.

149. **WILSON, PETER,** Offices of the Fisheries, Girvan, Ayrshire, Scotland.
Herring Drifter.
Deep Sea Boat.

150. **McMILLAN, ANDREW,** 33 Eton Street, Hessle Road, Hull.
Model of Boat for conveying Fish from the Smack to the Steam Cutter. Showing the arrangement for life-saving. Scale 3 in. to the foot.

151. **TAYLOR, ALEXANDER,** Boatbuilder and Fish Curer, Landhaven, Fraserburgh, N.B.
Model of Deep Sea or Herring Boat.

The Best and Cheapest. First Established 1825.
NEAVE'S FOOD FOR INFANTS AND INVALIDS.
IN ONE-POUND ONE SHILLING CANISTERS.
SOLD EVERYWHERE. WHOLESALE OF THE MANUFACTURERS,
J. R. NEAVE & Co., Fordingbridge, England.

**TAYLOR, ALEXANDER**—*continued.*

Model built on a scale of 1 in. to the foot, the Lug Sail to work by aft the Mast without hoisting or lowering in the process of tacking; likewise Permanent Safety Rails round the fore part of the boat, and Portable Rails round the after part.

Model of Deep Sea or Herring Fishing Boat.

Model built on a scale of ½ in. to the foot, with alterations on the Lug Sail; also more safety provided for the steersman, and with a Winch for hoisting or lowering the mast.

52. **WALES, H.R.H. THE PRINCESS OF,** Marlborough House, London, W.

Model (Working), representing two Fishing Boats at Sea.

53. **WHETHAM, S. & SONS,** 40 Gracechurch Street, London, E.C., and Bridport, Dorset.

Fishing Nets.
Twines.
Lines. Canvas.

55. **BRIGHT & ROBINSON,** Pack Horse Hotel, Boat House, Staines, Middlesex.

Boat for Fishing and Angling on Rivers.

56. **CRITTON, HENRY,** Cobholm, Southtown, Yarmouth.

Half Model of Sailing Trawler, and also Model of Life-boat.

57. **WATSON & FOX,** Shipbuilders, Great Western Docks, Plymouth.

Model of lines of Plymouth Trawler from which eight vessels have been built.

Model of lines of Plymouth Trawler.

Half-model of Plymouth or South Coast Trawler, from which eight vessels have been built; length, 70·4; breadth, 17·5; depth, 9·4; register tonnage, 47.

Half Model of Plymouth Trawler. This vessel is fitted as a Yacht, and cruises three months in the summer, and Trawls the remainder of the year; length, 73·5; breadth, 17·2; length, L.W.L., 70·2; depth, 10·0; Reg. Ton. 46 tons; Y.R.A. Rule, 74 tons.

58. **GARROOD, CHARLES,** South Lodge, Forest Hill, London, S.E.

A Drawing of Boat, showing apparatus to present capsizing.

**ANDERSON, ABBOTT, AND ANDERSON'S**
**PATENT TANNED CANVAS RUBBER-LINED FIRE HOSE,**
**AS SUPPLIED TO THE LONDON METROPOLITAN FIRE BRIGADE.**

From the "TIMES," Dec. 5th, 1879.—"Yesterday the leathern hose of the Metropolitan Brigade was given up in favour of a New Tanned-Canvas Hose Lined with India-Rubber, about 80,000 ft. of which has been manufactured for the Brigade by the Inventors, Messrs. ANDERSON, ABBOTT, and ANDERSON. The new hose was tested up to 300 lb. pressure on the square inch, and, with the exception of one short length, all was accepted. The new hose has the advantage of being waterproof, and can convey water through a warehouse or room without damage by leakage to the goods. It is claimed for it that it is cheaper, lighter, and stronger than leathern hose, will not require so much labour to convey it to the hydrants, does not need dressing to keep it in order as leather does, and is not so liable to be burnt. Captain Shaw was yesterday present at the testing of the hose, and expressed himself perfectly satisfied with the new material."

87, QUEEN VICTORIA STREET, E.C., LONDON, ENGLAND.

159. **SUMMERS, ANDREW,** 42 Cairnbulg, Fraserburgh, Aberdeenshire.
Model, Fishing Scull, half real size with mock baited line, all got up and made by the Exhibitor.

160. **TARNER, G. EDWARD,** 35 High Street, St. Marylebone, London, W.
Sectional Sketch Model of Ship. Illustrated Pamphlet—"Suggestions for Increasing the Safety of Ships," by the combination of hollow-end compartments with girder keel, with suggestions attached, accompanied by two small whole models, and lead weights for showing the effect of hollow-end compartments by experiment (exhibited at the Shipwright's Company's Exhibition at Fishmonger's Hall, 1882), a system of construction applicable in a greater or less degree to ships and vessels of all sizes and for all purposes.
Section Model of Ship in glass case.
Two small Models and two Lead Weights on stand under glass cover.

161. **MOIR, JAMES,** 11 Upper Grove Place, Edinburgh.
Three Oil Paintings and three sectional elevations of the different boats in use on the North-east Coast of Scotland.

162. **WILKINS, FREDERIC,** 55 Poland Street, London, W.
Drawings of Breakwaters, Harbours of Refuge, Landing Stage, Submarine Vessel and Station, Fishing Vessel.
"Wrecks and Drawing," a pamphlet.

163. **WATSON, JOHN,** 29 North Portland Street, Glasgow.
Portable Canvas Canoe. With water-tight compartment of 400lbs. displacement. Canoe when open is 12 feet long by 30 inches broad, and 14 inches deep. A double paddle 7 feet 3 inches long. Canoe when closed rolls up into a Cylinder 3 ft. 3 in. long by 9 in. in diameter, including Paddle and Seat, and weighs 30 lbs. with everything complete.

164. **COHEN, AARON,** Horning, Norfolk.
Model of Sailing Boat, scale 1 in. per foot, suitable for Fishing, &c. One person can easily manage it through bridges, &c., as the mast swings in a tabernacle, and is balanced by lead.

**India-Rubber Belting.** **India-Rubber Lined Fire Hose.**
**Leather ,, ,, ,, Delivery and Suction Hose.**
**Cotton ,, ,, ,, Steam Hose.**
**Patent Cerofilum ,, Woven Canvas Hose (Seamless).**
**India-Rubber Sheet, Valves, Buffers, Washers, Tubing, Packing, Mats, Cords, Tyres, Squeegees, &c.**

ANDERSON, ABBOTT, & ANDERSON,
**INDIA-RUBBER MANUFACTURERS.**
*Contractors to the Admiralty, the War Office, Metropolitan Board of Works, and London Metropolitan Police.*

**DONALDSON, ROBERT,** 5 Quay, Dumbarton, N.B.
Full Model of Decked Fishing Boat, from light-water draught, Lug Sail which does not required to be dipped, and showing Mainsail and Staysail in one. Length, 42 ft. keel, 10 ft. beam. Scale 1 in. to the foot.
Model of Open Fishing Boat, complete. Length, 26 ft. keel, 6 ft. beam. Scale ½ in. to the foot.
Model of Punt, ½ in. to the foot.
Model of Cot, ½ in. to the foot.
Model of Punt.
Model of Cot used for shooting wild fowl.

**CORDING, J. C.,** Piccadilly, London, W.
Canoe.

**JOHNSTON, WILLIAM,** Scalloway, Shetland, N.B.
Model of a Fishing Boat with a newly invented form of Lug Sail. Constructed so as to allow the boat to tack without being dipped, and various other advantages. Also photographs to explain working of same.

168. **DENT, EDWIN,** 6 New St. Mark Street, Dansome Lane, Hull.
Model of Boat for Conveying Fish From Catcher to Carrier.

169. **SMITH, GEORGE,** Rock Channel Shipyard, Rye, Sussex.
Model of a Well Vessel.

170. **TEASDEL, WILLIAM,** C.E., Harbour Works, Great Yarmouth, Norfolk.
Model of a Fishing Smack's Boat for carrying Fish, made so as to ensure the greatest possible safety to the crew.
Drawing, showing Plan of Scotch Fishing Boat, constructed so as not to sink, even when full of water.

171. **McBAY, ALEXANDER,** Belhelvie, by Mennie, Aberdeenshire.
First-class Herring Boat at present in use, with improved Rig, and handy for Working.
Bobbing and Gigging Lines for Cod, Mackerel, Herrings or Pilchards.
Stand for lines.

*As worn by Royalty and other Members of the Royal Yacht Club.*
(Copy of Testimonial.) HOME OFFICE, *September 3rd*, 1878.
MESSRS. ANDERSON & CO., You made me an Oilskin Coat about seven years ago, which has lasted in capital condition until this year.
(Signed)
A. F. O. LIDDELL.
THE ROYAL YACHTING COAT.
SOLE MAKERS,
37, QUEEN VICTORIA STREET, E.C.
ANDERSON, ABBOTT, & ANDERSON.

172. **BERTRAM, J.**, 241 King's Road, Chelsea, London, S.W.
Improved Mast to do away with Dipping of Lug.
An Improved Rig, which will enable the crew to work the boat much easier than the old sytem of the Dipping Lug, the weatherly qualities will be found far superior to the old Rig, and, having a Centre Board, will prevent the ballast from shifting, part of the floor being left off to show the provision for ballast. Likewise a Model of Fish Box that will act as Lifebuoy; by connecting such boxes together, a raft may be formed.

173. **STEVEN, GEORGE**, Boatbuilder and Fisherman, Gardenstown, Banffshire, N.B.
Model of Drift Boat for Herring Fishing, 40-ft. Keel, ½-in. Scale, Clincher Built, Full Rigged.

174. **LOYNES, JOHN**, Elm Hill, Norwich.
Model of Centreboard Rowable Sailing Boat, fitted with interchangeable rigs, instantaneous adjustable awning, and other special fittings for cruises.
Model of a Shallow-Water Yacht, exhibiting a collapsible and movable cabin, giving at pleasure extra well room by day and head room by night.
Chart and Photographs, illustrating the Angling and Yachting waters for which the above boats have been primarily designed.

175. **KEMP, ROBERT, JUN.**, Mutford Bridge, Lowestoft, Suffolk.
Model of Freshwater Fishing Boat.
Model of Freshwater Fishing Yacht.
Designed to combine with the light draught and handiness required on the Norfolk Broads, the greatest possible amount of comfort.

176. **HOLM, FRANCIS**, Retreat, Penryn, Cornwall.
Model of Deep Sea Trawler.
Model of Boat adapted for Mackerel or Pilchard Drift Fisheries.
Model of Dredging Boat for Dredging Oysters in Bays, Roadsteads, or Harbours.
Models of 30 ft. and 18 ft. Sailing Punts to stand stormy weather and turn to windward fast.
Model of 17-ft. Rowing Boat as lately sent to Plymouth for Mackerel-hooking, and highly approved of by owner.

PASCALL ATKEY & SON,
*Yacht Fitters and Stove Makers,*
ALSO MANUFACTURERS OF
EVERY DESCRIPTION OF SHIP WORK AND FISHING GEAR.
**West Cowes, Isle of Wight.**

. **HODGES, S. H.,**
Models.

. **BUIK, J. H. & CO.,** South Rope Works, Wick.
Model of Fishing Boat.

. **THOMPSON, R.,**
Models.

. **PARSER & COMPANY, Limited,** by Edward Gibbon Swann, Chairman, 21 Arundel Street, Strand, London, W.C.
Life-boats, their equipments, &c.

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## DIVISION V.

### Ropes and Canvas suitable to Fishing Vessels.

96. **BRACEY & SON,** Yarmouth.
60 fathoms 4 in. White Manilla 4 Strand.
60 fathoms 3 in. White Manilla 4 Strand.
60 fathoms 2½ in. White Manilla 4 Strand.
100 fathoms 2½ in. Hemp 4 Strand.
60 fathoms 7 in. Trawl Rope.
60 fathoms 7 in. Manilla Trawl Rope.
60 fathoms 4½ in. Manilla Warp.
60 fathoms 5 in. Coir Rope.
50 fathoms 5 in. Bolt Rope.
60 fathoms 4 in. Bolt Rope.
60 fathoms 3 in. Bolt Rope.
60 fathoms 4 in. Yellow Manilla Rope.
60 fathoms 4 in. Tarred Manilla Rope.
65 fathoms 8 in. Hemp Winding Rope.
65 fathoms 8 in. Hemp Winding Rope, Shroud Laid.
Two 30 fathoms 5½ in. Manila Bridles.

197. **UNITE, JOHN,** 291 Edgware Road, London, W.
A Collection of Ropes suitable for Fishing Vessels.
Samples of Canvas for Fishing Vessels.

198. **FROST BROTHERS,** 11 London Street, E.C., and at Shadwell.
Trawl Warps, Ropes, Net Twines, Lines, &c., for fishing purposes.

**ANDERSON, ABBOTT, & ANDERSON'S**
37, Queen Victoria Street,
London, E.C.
LAWN TENNIS
BATS,
BALLS, SHOES,
NETS, POLES, BAGS.
SETS COMPLETE.

199. **THOMSON, M. C.**, 67 Great Clyde Street, Glasgow, and 18A Basinghall Street, London, E.C. Works: Ward Mill, Arbroath, N.B.

Sailcloth. Brands:—Crown Hurricane, Crown Royal Extra, Extra all Long Flax, Royal Northern Yacht Canvas, Double Double Waggon Canvas, No. 1 Strong Hemp Tarpauling, A Imperial Duck.

Twines:—No. 1 Fine Flax Seaming, No 1 Fine Flax Roping.

200. **WARRINGTON WIRE ROPE WORKS, Limited.** Office and Warehouse: 13 Goree Piazzas, Liverpool. Works: Warrington.

Show Case of Samples of Ropes adapted for all general purposes.

Samples of Wire Ropes adapted for trawling and deep-sea fishing.

Sample Coils of Trawl Ropes, Bridles, Head and Foot Ropes, Fishing Twines of Cotton and Hemp, Cotton Rope and Sundry Fishing Gear.

201. **BELFAST ROPEWORK COMPANY (THE), LIMITED.** Belfast, Ireland.

White Manilla Boat Tie.
White Manilla Headfast.
White Manilla Backrope.
White Manilla Lines, assorted sizes.
Tarred Manilla Trawl Warp.
Tarred Manilla Bridle.
Tarred Russian Hemp Stayfall.
Tarred Russian Hemp Laniard.
Tarred Russian Hemp Boltrope for Sails.
Tarred Russian Hemp Backrope.
White Russian Hemp Hoist Rope.
Coir Rope.
White Sisal Rope.
White Sisal Lines, assorted sizes.
Plaited Lines, assorted.
Package Lines, &c., assorted, various qualities.

202. **RUTHERFURD BROTHERS**, Ingram Street, Glasgow.

Sample Bolts of Sailcloth, Tarpauling and Linen Duck, along with Twine for Sewing same.

Sailcloth, &c., for use of Fishing Smacks and Ships generally.

S. & H. HARRIS'S
EBONITE
WATERPROOF
BLACKING,
*FOR BOOTS, HARNESS, BAGS, AND ALL BLACK LEATHER.*
SOLD BY ALL DEALERS THROUGHOUT THE WORLD.

**WEBSTER, FRANCIS, & SONS,** Alma Works, Arbroath, N.B.
Flax and Cotton Canvas and Twines.

**DIXON, CORBITT, & SPENCER,** Teams Hemp and Wire Rope Works, Gateshead upon Tyne.
Manilla and Russian Hemp Ropes, entirely Machine Spun, and laid upon Self-contained Machines.
Galvanized Patent Steel Wire Flexible Warps and Running Ropes on Reels and Winches.
Patent Stoppers for Wire Towlines.
Cases containing Samples of every description of Fibrous and Wire Ropes and Lines, Electric Light Leads and Insulated Wires, Patent Testable Lightning Conductors, Copper, Iron, and Steel Cords, Engine Packings, &c.

**HAWKINS & TIPSON,** 52 and 53 Crutched Friars, London, E.C., and Globe Rope Works, Millwall, E.
Two 6-in. Tarred Manilla Trawl Warps.
Two pairs of 5 in. Tarred Manilla Bridles.
Two Coils Coir Rope.
Ten Coils Manilla Rope Running Gear.
Six Coils Bolt Rope.
Tarred and White Lines, comprising Deep Sea Lines, Lead Lines, Halliards, &c.
Tarred Hemp Warp.
Sample Case Wire Rope.
Two 3¾-in. Tarred Manilla Herring Warps.
Two Coils Tarred Hemp Running Gear.

**LONDON STEAM ROPERY COMPANY,** 12 Upper East Smithfield, London, E. Works, Bermondsey Wall, S.E. Branch Store for Eastern Counties, Admiralty Wharf, Lowestoft.
White Manilla Warps.
White Manilla Rope for Running Gear.
White Manilla Lines.
Yard Ditto for Trawl Warps.
Ditto for Bridles.
Ditto for Herring Warps.
Bolt Ropes for repairing sails.
Coir Warps and Tarings.
White Hemp Rope.
Yard Hemp Rope.
Staple quality for Running Gear.

ANDERSON, ABBOTT, & ANDERSON'S
**Are Unequalled.**
WADERS WITH BROGUES ATTACHED.
**Are Guaranteed.**
37, QUEEN VICTORIA STREET, LONDON, E.C.

**LONDON STEAM ROPERY COMPANY**—*continued.*

Fishing Lines of all descriptions.
Deep Sea Lead Lines.
Hand ditto.
Signal Halyards.
Hausline.
Marline.
Hambro Lines, &c.

207. **BULLIVANT & CO.**, 72 Mark Lane, London.
Patent Flexible Steel Wire Rope for Fishing Ropes, Trawl Warps, Bridles, &c.
Patent Flexible Steel Wire Rope for Running Rigging and Ties.
Patent Flexible Steel Wire Hausers and Cables, with appliances for working them.

208. **SUTTON BROTHERS**, Lopen Mills, near Ilminster, Somerset.
Dressed Canvas.
Undressed ditto.
Dressed Twines.
Undressed ditto.

209. **EDGINGTON, BENJAMIN**, 2 Duke Street, London Bridge, London, S.E., Tent Makers to H.M. the Queen and H.R.H. the Prince of Wales.
A Collection of Canvas (Green) prepared by Patent "Willesden" Process, Rot-Proof and Water Repellent for Sails, Covers, &c. Various qualities.
Canvas, Brown Waterproofed Cotton.
Canvas, Flax and Cotton.
Blocks and Pulleys.
Sail-making Tools and Needle.

211. **LESLIE, JOHN**, Rope Works, Macduff, N.B.
Collection of Rope Suitable for Fishing Vessels.

212. **DONALDSON, ROBERT**, 5 Quay, Dumbarton, N.B.
Model of Lugsail Yard, which does not require to be dipped in beating to windward.

213. **JAMES, E. C.**, British Yacht Fleet, Hythe, Hants.
Model Steel Frame Work to take the place of ordinary Mast and Rigging.

BULLIVANT'S
PATENT FLEXIBLE STEEL WIRE ROPE
Is only one-third the weight of Hemp Rope of similar strength.
Is far more durable, easier handled, and Cheaper in first cost than Hemp Rope.
**BULLIVANT AND CO., 72 MARK LANE, LONDON.**

**RUTHERFORD BROTHERS,** 48 Ingram Street, Glasgow.
Canvas, in bolts, for sailmaking, including Tarpauling Cloth, Linen Duck, and Seaming and Roping Twine, for Sailmaker's use.
Sailcloth for the use of fishing smacks and sailing ships, Twine for making sails, Linen Duck for Boat Sails, and Tarpauling Canvas.

5. **MITCHELL, ANDREW, & CO.,** Sail Cloth Makers, Princes Square, Glasgow.
Canvas for Sails and Sewing Twines for sewing same.

6. **RICHARDS & CO.,** Flax Spinners and Manufacturers, Aberdeen.
Flax Canvas.
Seaming Twines.
Canvas Hose Pipe, &c.

7. **MOORE, W. F., & SON,** Isle of Man.
Six Bolts of Canvas.

8. **DUCKHAM, HERBERT,** 35 Queen Victoria Street, E.C.
Ropes, both Wire and Hemp, used by fishermen.

9. **HAYWARD, RICHARD, & SONS,** West Chinnock and Tail Mill, Somerset.
Various kinds of Canvas and Seaming and Roping Twines; also the raw materials from which they are made in various stages, from the growing flax to the finished yarn; and various implements used in the manipulation.

10. **HAYWARD, RICHARD, & CO.,** Coker Sailcloth Works, Crewkerne, Somerset, and at 93 Minories, London, E.
Sailcloth (Canvas), as used for Heavy Sails in the North Sea Fishing Vessels and elsewhere.
Sail Twines.

11. **SHAW, JOHN,** Soho Street, Sheffield.
Improved Patent Flexible Steel Wire Ropes for Ships' Hawsers and Trawl Warps.
Special Steel Ropes for running gear, discharging cargo, &c.
Steel Cord for Halyards, Log Lines, &c.
Copper Rope Lightning Conductors.

WATERPROOF DRIVING
APRONS AND KNEE RUGS.
ANDERSON, ABBOTT, & ANDERSON,
37, Queen Victoria Street, London, E.C.

222. **DAVIS, J. T.**, Coborn Road, Bow, London, E.
Ropes for Fishing Vessels, Running Gear, Trawl Warps, &c.

223. **KNOWLES & KNOWLES**, Zebu Works, Southcoates, Hull.
Ropes and Cordage.

224. **LOVE & SON, JOHN**, Denburn Rope Works, Kirkcaldy, N.B.
Trawl Warps, Manilla and European Cordage, Coir Rope and Hawsers. Fishing Lines as used between the Tyne in England and the Moray Firth.

225. **CORNWALL, COMMITTEE FOR.**
Models of Boats.
Ropes, Canvas, &c.
(*Details will appear in the Second Edition of the Catalogue.*)

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DIVISION VI.

**Steam and hand capstans, compasses, barometers, telescopes, lights, lamps, fog horns, systems of signalling at night for fishing fleets and vessels, electric lights, luminous paint, and other equipment of fishing vessels, charts for fishermen.**

227. **HUGHES, HENRY, & SON**, 59 Fenchurch Street, London.
Samples of Binnacles and Compasses suitable for fishing boats.

Samples of Nautical Instruments, Lamps, Flags and Signals.

Charts and Books.

228. **NEGRETTI & ZAMBRA**, Holborn Viaduct, London, E.C.
Standard Barometers as made by Negretti & Zambra for the British Government.
The Meteorological Office Fishing Station Barometer.

The Board of Trade Marine Barometer.
The Fitzroy Marine and Station Barometers.
The Royal National Life-boat Station Barometer.
Marine Thermometers.

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ANDERSON, ABBOTT, & ANDERSON'S
**CAPE VENTILATING WATERPROOFS**
ARE UNEQUALLED.
37, Queen Victoria Street, London, E.C.

**NEGRETTI & ZAMBRA**—*continued.*

Negretti & Zambra's Patent Deep-Sea self-registering Thermometers.

Boat Compasses, Ritchie's Patent Liquid and Azimuth.

Tide, Wind and Rain Gauges.

Current Meter.

Marine Telescopes, Sextants, and Binocular Glasses.

Bourdon's Marine Pressure Gauges.

9. **FOX, CAPTAIN H. C.**, 3rd Batt., the Royal Fusileers, Royal Thames Yacht Club.

Mariners' Compass; by the use of which it is calculated that collisions at sea during Fog can be avoided. The steamer or sailing vessel will sound on either steam-whistle or fog-horn the "Morse" signal, denoting what course she is on—the signal for each course being marked on the different points of the compass, thereby rendering it unnecessary for captains of vessels to know the "Morse" alphabet.

10. **UNITE, JOHN**, 291 & 293 Edgware Road, London, W.

Seamen's Clothing and Waterproof Apparel.

11. **OLSEN, O. T.**, Fish-Dock Road, Grimsby.

Improved Flare and Fog-horn, with Signal Code.

Signal System for Fishing Vessels and Fleets.

North Sea Charts.

Fishing Banks.

Manuscript dealing with Partnership and Benefit Societies for the Fishery.

On the Best System of Life Insurance for Fishermen and of Insuring Boats, Gear, Nets, &c.

12. **WATSON, W., & SONS**, 313 and 308 High Holborn, London, W.C.

Yacht Aneroid Barometers, and Mercurial Barometers, with specially fitted tubes, to prevent possibility of breakage by concussion.

Yachting Binocular Glasses and Double Telescopes.

Special Night Marine Glasses, Compasses, Telescopes, Pilot Glasses, &c.

**ANDERSON, ABBOTT, & ANDERSON'S**

BOOTS, TROUSERS, STOCKINGS, **FISHING** BROGUES, BAGS, COATS,

ARE UNEQUALLED.

233. **IHLEE & HORNE**, 31 Aldermanbury, London.
Luminous Paint, Balmain's Patent.
Luminous Life-Buoys, Fishing-net Buoys, Mooring Buoys, Channel Buoys, Numbers for Pilot and Fishing Boats, Compass Cards, Fishing Baits, Danger Notice Boards for Weirs, &c.

234. **WOODCOCK, JAMES**, Burns Works, Sheffield.
Telescopes, Marine Glasses, Deep Sea Thermometers, Ships' Compasses, Microscopes.

235. **HAYWARD, R., & CO.**, Coker Sailcloth Works, Crewkerne, Somerset, and at 93 Minories, London.
Signal Flags, as used by fishing vessels when fleeting in the North Sea.

236. **KITE, C., & CO.**, Christopher Works, Chalton Street, London, N.W.
Sectional Model of Ship, showing application of Ventilators.

Full Size Ship Ventilator.
Full Size Ship Cabin Stove-pipe Cap.
Collection of Models of Ventilating Appliances, suitable for Fishing or other Vessels.

237. **HEATHORN, T. B., CAPT. R.A.**, 10 Wilton Place, Knightsbridge, London.
Water Brake, of such a method and construction as greatly to increase steering and way-checking power.

238. **BOYLE, ROBERT, & SON**, 64 Holborn Viaduct, London, E.C. and at Glasgow.
Collection of Boyle's Patent, Fixed, Self-acting Air Pump Waterproof, exhaust Ventilators; suitable for ships, yachts and fishing boats.
Collection of Boyle's Patent Fixed Down-cast Waterproof Ventilators for ships, yachts, and fishing boats.
Collection of Boyle's Patent Self-Acting Air-Pump Ventilators different designs and sizes, suitable for buildings and ships.

239. **WHITFIELD, HAKER, AND LAMB**, Manufacturers of Ship, Railway, Tramcar, and every description of Lamps, Humber Lamp Manufactory, Commercial Road, Hull.
Lamps.


# BOYLE'S SYSTEM OF VENTILATION FOR SHIPS AND BUILDINGS

is pronounced by the most eminent scientific and practical authorities in the kingdom to be the most efficient in existence. At the International Ventilation Competition, London, 1882, it was adjudged the Victor and awarded the Prize £50. It also gained the Gold Medal, London, 1882.

"Since these excellent ventilators have been introduced we have now got *perfect* methods of ventilation."—Dr. B. W. Richardson, F.R.S.

ROBERT BOYLE AND SON, 64 Holborn Viaduct, London, and 110 Bothwell Street, Glasgow.

0. **RUDD, W. H.**, Queen's Road, Great Yarmouth.
Model of Steel Warp Coiling Apparatus, adapted to steam capstan engine, for saving space and labour in herring fishing boats, especially of the Yarmouth and Lowestoft class.

1. **HALL, DUNBAR, & CO.**, St. Ninian's Colour Works, Leith, near Edinburgh.
Anti-fouling Composition for Ships' Bottoms.
Collection of Colours, Paints, Varnishes, Lacquers, Tars, Cutch, and similar articles.
Models of Vessels coated with Anti-fouling Composition.

Specimens of Iron Drums, &c., containing Composition, Paints, &c.

2. **PILLEY, WILLIAM, JUN., & CO.**, Upper Highgate, Birmingham.
Lights for Fishing Vessels.
Fog Horns of various kinds.

3. **PATENT FERRULE COMPANY**, Sheepcote Street, Birmingham.
General Shipping Tackle.

4. **HERON, THOMAS**, Gas-lighting Engineer, Pump Street Works, London Road, Manchester; also Dublin and London.
Heron's Patent Coast-lighting Lanterns, from 20 to 2000 candles.
Heron's Patent Perfect Gas Lamp.
Heron's Patent Duplex Gas-Burners.
All Kinds of Gas Lighting Appliances.

5. **BOWMAN, JAMES**, 22 Square, Huntly, Aberdeenshire, N.B.
Port and Starboard Side Lights.
Patent Binnacle Lamp for burning heavy mineral oil.
Trigonal Signal Light, for small fishing boats under 20 tons.
Lights for Trawling Vessels with ruby globes and no chimney burners, same principle as Anchor Lights.
Globular Anchor Light made so that if a globe is broken a new one can be fitted in by any one.
Improved Masthead, Side, and other Ship Lights.

**ANDERSON, ABBOTT, & ANDERSON'S**
**INDIA-RUBBER**
HOT-WATER BOTTLES.
**No Household should be without them.**
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246. **LAFARGUE, ALPHONSE,** Palace Chambers, 9 Bridge Street, Westminster, S.W.

New Hydraulic Steering Gear for Manœuvring Vessels quickly to the saving of life and property at sea, thus preventing collisions and danger through fogs or otherwise.

This apparatus is admirably suited for river and canal navigation, where quick, powerful and momentary command of the rudder is required. One man is sufficient in any weather to control the largest ship without the assistance of the crew when they would otherwise be usefully employed.

247. **LONDON AND LEICESTER HOSIERY CO., Limited,** 41 Charterhouse Square, London, E.C., & Winifred Street, Leicester.

One Griswold's Stocking Knitter. Diam. 3¼. 52 Needles.

One Griswold's Stocking Knitter. Diam. 3¾ in. 60 Needles.

One Griswold's Stocking Knitter. Diam. 4½ in. 52 Needles.

One Griswold's Stocking Knitter. Diam. 4½ in. 60 Needles.

One Griswold's Stocking Knitter. Diam. 4½ in. 72 Needles.

One Griswold's Stocking Knitter on Pedestal. Diam. 4½ in. 84 Needles.

One Griswold's Stocking Knitter for Fishermen's Overstockings, coarse gauges. Diam. 5¼ in. 60 Needles.

One Knitting Machine, for Fishermen's Jackets and Guernseys. Diam. 12 in. 120 Needles.

One Knitting Machine, for Fishermen's Jackets and Guernseys. Diam. 12 in. 180 Needles.

Sundry Apparatus and Samples of Goods made on above Machines.

248. **DYER & ROBSON,** East Greenwich, London.

Signalling and Life-Saving Apparatus.

249. **CLARBOUR, F.,** 150 Wellington Street, Glasgow.

Busch's Patent Gas Governors.

Busch's Patent Gas Governors exhibited in action.

Largely used by Her Majesty's War Office, Office of Works Prisons Board, Post Offices, Museum, Lighthouses, &c. Ar

MORRELL'S CIVET CAT,
60, 61, 42, BURLINGTON ARCADE, PICCADILLY, W
PRESENTS - ELEGANT, CHEAP, and USEFUL.
WORK CASKETS, CARRIAGE PURSE BAGS, RUSSIA ALBUMS, FRAMES.
NOVELTIES IN PLUSH, BRASS, QUAINT LETTER WEIGHTS
BANTAMS, 10s. 6d.
OLIVE-WOOD BOAT INKSTAND, 5s. 6d. GRACEFUL CHINA FIGURES.
ENGLISH CUTLERY, KNIVES, SCISSORS, NEEDLES.

**CLARBOUR, F.**—*continued.*

self-acting, reliable and durable. Will save 25 per cent. of gas, increase the light, and prevent smoke and vitiated air in mills, works, hospitals, churches and private houses. They require no attention, do not get out of order, and will last a lifetime.

50. **BRYER & SONS, J.**, Late Janet Taylor & Co., 104 Minories, London, E.C., Manufacturers.

Special Night Glasses.
Quadrants, Sextants.
Anti-Vibrating Spirit Compasses for Steam Fish Carriers and Smacks.
Improved India-rubber Suspension Compasses for the bridge of small steamers.
Mercurial Barometers for Fishing Stations.
Aneroid Barometers for Smacks.
Signal Reading Telescopes and Double Glasses.
Signal and Side Lamps.
Binnacles.
Flags, &c.

51. **EDGINGTON, BENJAMIN**, 2 Duke Street, London Bridge, London, S.E.

Sets of Signal Flags, and a Collection of National Flags.
Buntings of all colours for flag making.

52. **ATKINSON & PARSONS.**

53. **BARTON, CHARLES EMERSON**, Manufacturer and Patentee, Providence Works, 56 & 58 Eastgate, Great Grimsby.

One Ice Breaker, fitted for Steam Power. Suitable for Ice Companies.
One Ice Breaker suitable for the Mackerel Trade.
One Ice Breaker, fitted for Hand Power, for Fish Merchants.

One Ice Breaker, fitted for Hand Power, as used on board fishing vessels.
One Ice Breaker, of smaller size, fitted for Hand Power, as used by fishmongers.

FLAGS FOR SHIPS, STEAMERS, YACHTS, BOATS, CASTLES, MANSIONS, TENTS, CRICKET, FOOTBALL, ROWING, AND SAILING CLUBS.
THOMSON AND SON,
Sole Flag Makers to H.M. Navy, also
Makers to H.M. Government and Foreign Governments.
21, London Street, Mark Lane, E.C.; and 283, Wapping, E.

**BARTON, CHARLES EMERSON**—*continued.*
One Weighing Machine and Weights for 20 stone.

One Fish Kitt to weigh Fish in.
Three Handbarrows of different sizes for Fish Trade.

Two Cod or Ice Baskets.
One Pair Ice Dogs for Crane.
One Pair Hand Ice Dogs.

254. **GRIFFITHS, BERDOE & CO. (THE SANITARY PAINT CO.), Limited,** 34 Leadenhall Street, London, E.C., 51 South John Street, Liverpool.
Specimens of Sanitary Paints for Fishing Smacks, &c.

255. **WOEFF, S. W.,** 75 and 76 High Street, Southampton.
The International Code of Signal Flags, in tanned canvas pocket signal bag (including Pilot Jack), with printed instructions on linen for signalling at sea, and pockets for burgee, ensign, and signal book.

256. **STEELE, HENRY,** Schoolhill, Macduff, N.B.
Complete Set of Blocks suitable for a lug-sail herring and fishing boat.

257. **WALKER, WILLIAM, & SON,** 22 Netherkirkgate, Aberdeen.
Set of Brass Signal Lights, two brass side, one anchor, and one masthead lantern.
Set of Copper Signal Lights, two copper side, one masthead, and one anchor lantern.
Side and other Signal Lights for Boats.
Torch Lights or Flareups.
Various Fog Horns.
Galvanized Steel Buoys for fishing nets.
Galvanized Water-Tanks.
Engine-Room Lamps.
Galvanized Water Flasks.

258. **LUCAS, JOSEPH, & SON,** Little King Street, Birmingham.
Collection of Ship Lamps, including the Patent "Tom Bowling" Globe Lamp.

**LIFE BELTS AND VESTS.**
**No person should venture to Sea without them.**
**ANDERSON, ABBOTT, AND ANDERSON,**
**37, QUEEN VICTORIA STREET, LONDON, E.C.**

**TROTTER, JOHN, & CO.,** 7 Great Winchester Street Buildings, London, E.C.

Patent Revolving Apparatus for occulting Coast and Harbour Lights, constructed so as to work continuously without attention.

Patent Revolving Apparatus for occulting Coast and Harbour Lights, fitted with oil lamp to work continuously for 14 days.

**BLUNDELL, SPENCE & CO., LIMITED,** 9 Upper Thames Street, London; and Hull.

Anti-fouling Composition for Fishing Smacks.
Anti-fouling Composition for Iron Vessels.
Paints, White Zinc Paint, Varnishes, Colours.
Extra Boiled Baltic Linseed Oil for Taupaulins and Oil Skins.

Pure Baltic Linseed Oil for Fishing Nets.
Paints, all Colours, ready mixed for use, in sealed tins.
Colza Oil for Binnacles.

261. **BOND, J., & SON,** 106 Narrow Street, Limehouse, London, E.
Blocks, Oars, Steering Gear, Capstans, &c.

262. **BURWOOD, JAMES, & Co.,** South Denes Road, Great Yarmouth.
Samples of Blocks used in fitting out Trawling and Drift Net. Fishing Vessels at Great Yarmouth.

263. **HUNTER, H.,** 66 Cressingham Road, Lewisham, S.E.
Lug Sail, &c.

264. **DICKENSON, J. E.,** 33 Peters Lane, Liverpool.
Cabinet containing Collection of Blocks, Deadeyes, Hardware, and fittings suitable for Fishing and Trawl Boats, Steam or Sail; also Internal Bindings for Blocks, Patent and Metaline Brushes, &c.

265. **NOBLE, ALEXANDER,** late **SEAMAN,** 55 Hanover Street, Fraserburgh, Aberdeenshire.
Model Carriage for Drawing Boats up from the Sea, also for launching them.

266. **ROLLO, JAMES,** Mason, Fraserburgh, N.B.
A Model for Drawing up and Launching Fishing Boats.

BLUNDELL'S ANTI-FOULING COMPOSITIONS
FOR FISHING SMACKS.
BLUNDELL'S ANTI-FOULING COMPOSITIONS
FOR IRON AND WOODEN VESSELS.
BLUNDELL'S WHITE ZINC PAINT, VARNISHES, COLORS,
OILS AND PAINTS.
**BLUNDELL, SPENCE, & CO., Limited, HULL and LONDON.**

267. **INDESTRUCTIBLE PAINT COMPANY,** 27 Cannon Street, E.C.
Ships paints, &c.

268. **WELLS, WILLIAM,** 50 Commercial Street, Leith, N.B.
Marine Glue.
Anti-Fouling Composition.
Elastic Cement for inside Marine Boilers, for preventing leakage and pitting.
Composition for preventing Nets, Lines, Bladders from Rot.

269. **DAY, WILLIAM, & CO.,** Patentees, Manufacturers and Contractors, Blackheath, London, S.E.
Specimen Jar and Basket Patent Composition Paint.
Specimen Plates coated with Patent Black Varnish for preservative or 1st coating of the outside bottoms of fishing smacks, &c. Ditto, Patent Metallic Composition for 2nd coating to prevent fouling. Ditto, Patent Enamel Paint, Marine Cement, &c.

270. **HUBBUCK, THOMAS, & SON,** 24 Lime Street, London.
Composition for Ships and Fishing Vessels Bottoms, to prevent fouling.
Paints, Oils, and Varnishes.

271. **STAVERS, G.,** The Jerusalem Exchange, Cornhill, London, E.C.
Two Half-Models, fitted with fish fin rudders.
"Fish Fin Rudders," for the safe steering of ocean steamers when the main rudder becomes disabled; and also for increased steering power when in the Suez Canal or other narrow waters.

272. **CATOR, R.P., REAR-ADMIRAL,** Langley Farm, Beckenham, Kent.
Alarm Buoy (Self-acting). For denoting the position of the ship ahead, when steaming in column in a fog.

273. **SAX, JULIUS,** 108 Great Russell Street, Bloomsbury, London, W.C.
Electrical Signals for Vessels.

274. **HOLMES, N. J.,** 8 Great Winchester Street, London, E.C.
Life-Saving Apparatus.

**J. E. DICKINSON,**
**BLOCKMAKER AND SHIPSMITH,**
33, PETER'S LANE, HANOVER STREET, LIVERPOOL.
Manufacturer by Special Machinery and Steam Power of Blocks, &c., for every description of Vessel and purpose. Also of Patent Internal Block Bindings, and Metalline Bushed Sheaves.
*N.B.—Special Terms to Shipbuilders and for Export.*

**BISHOP, E.**, Portland Road, South Norwood, London.
Refrigerators for Preserving Fish and Meat. No Ice required.
Ship and Yacht Lamps.
Automatic Sockets.

**BECK & CO., Limited,** 130 Great Suffolk Street, Southwark, London.
Fog-horns, to be seen in action in the Machinery Division.

**BAPTY, S. S.**, 65 Blackheath Road, Greenwich.
Collection of Klinkerfue's Patent Weather Compass.
This instrument is a very ingenious combination of the barometer and hygrometer, giving a forecast of the approaching weather, based on the barometric pressure and the amount of moisture in the air.
One Log suitable for use by fishermen.
Seamen's Apparel.

278. **HARDING, CHARLES W.**, Assoc. M. Inst. C.E., King's Lynn, Norfolk.
Vessel for Compressing Air by means of the waves of the sea.
This vessel is capable of being moored in the Mid-Atlantic, and used there for meteorological purposes, being connected with the shore by means of an electric cable. When used in 1000 fathoms of water the cables are steel wire hawsers, with buoys attached every 80 or 100 fathoms to take the dead weight of the hawsers.

279. **BODILL, PARKER & CO.**, Birmingham.
Samples of Thimbles for Sails, Brass and Iron.
Samples of Iron Shackles for Rigging.
Samples of Iron Boat-hooks.
Samples of Iron Boat Rowlocks.
Samples of Lamps for Smacks.
Samples of Fog-horn Bellows.
Samples of Wooden Bulls'-eyes for Rigging.

280. **WALKER, THOMAS, & SON,** 58 Oxford Street. Birmingham.
Ships' Logs.
Sounding Machines.
Log and Halyard Lines.
Bar Magnets.
Magnetic Needles.
Lenses for Ship Lights.

**ANDERSON, ABBOTT, AND ANDERSON'S**
LEATHER LINED **FISHING BOOTS** REQUIRE NO DRESSING.
**37, Queen Victoria Street, London, E.C.**

281. **GREENWAY, CLIVE, VALE & CO.,** The People's Hall Works, Birmingham.
Ship Locks and Brassfoundry; Ship Signal, Saloon, Berth, Engine Room, Deck and other Lamps and Lanterns; Side Lights; Guns, Cannonade, Mortars and Carriages, Bells, Belfreys; Portable Rivet Forges, Ship Chandlery of every kind; Cork Fenders; Life Buoys, Belts and Jackets; Signal Balls; Flash Lights, Rockets and Blue Lights; Bellows and other Fog Horns; Shipping Tackle; Whip Gins, &c.

282. **NUNN, WILLIAM, & CO.,** Neptune Works, 204, 205, & 206, St. George Street, London, E.
Two Sets of Signal Lamps.
Collection of Barometers and Compasses.
Collection of Jimble and Cabin Lamps.
Set of Webb's Patent Deck Lights.
Sundry Lamps and Fittings for Smacks and Herring Boats.
Patterns of Blocks, Masthooks, &c., for Fishing Boats.

283. **SIEBE, GORMAN & CO.,** 187 Westminster Bridge Road, London, S.E.
Submarine Electric Lamp.
Submarine Lamp for burning Oil.
Set of Diving Apparatus, Royal Navy pattern, for one or two divers, fitted with telephone.

284. **WARNER & SON,** Cripplegate, London, E.C.
Fog Bells.

285. **MASSEY, J. EDWARD,** Original Inventor, 17 Chadwell Street, Clerkenwell, London, E.C.
Logs and Sounding Machines (Patent) for use on board ship, some of these logs having their registering indicator on Deck; also Machines for ascertaining the rates of currents and streams; also Working Models and Parts illustrative of same and conveying technical information as to the construction and working of such machines.

286. **CHORLTON & DUGDALE,** 19 Blackfriars Street, Manchester.
"Excelsior" Spring Single Berth.
"Excelsior" Spring Double Berth.
"Excelsior" Spring Hinged Berth.

GREENWAY, CLIVE, VALE & CO.,
MANUFACTURERS OF
**SHIP LOCKS and BRASS FOUNDRY,**
*Signal, Saloon, Berth and other Ship Lamps, Shipping Tackle, &c.*
THE PEOPLE'S HALL WORKS,
LOVEDAY STREET,
AND PLUME WORKS, NECHELLS, **BIRMINGHAM.**
*(See above.)*

7. **MATHESON, JOHN SELLAR,** Leith, N.B.
Nautical Instruments.

8. **GREGORY, JAMES,** Portland Works, Lincoln.
A Continuous Screw "Coilable Screw Hoist," for raising fishing or any other vessels of whatever weight, or dimensions.

An Obtuse-Angled Riddle, encased in a frame on four legs, forming stool for cabin. The riddle when required will be useful for the following purposes: riddling ashes from stoves, washing vegetables, and cleansing all descriptions of shell-fish.

89. **HEATH & CO., Limited,** 28 Fenchurch Street, London, E.C.
Patent Composite Arc and "Duplex" Sextants and Octants.
Patent "Argus," "Duplex," "Oriental," and other Binocular Glasses.
Fisherman's Binocular Glass.
Fisherman's "Life Buoy" Aneroid and other Barometers.

Fisherman's Boat Spirit Compass and other Compasses.

Fisherman's and other Pocket Compasses.
The "London Polaris," the "Transparent" Course Corrector.
Bain and Ainsley's Corrector, and other deviation detectors.
McKenzie's Patent Protractor and rule, and other Nautical Instruments.
Fisherman's "Luminous Compasses."
New Patent "Taffrail" Log.

290. **DOLLOND & CO.,** Saint Paul's Churchyard, London, E.C.
Established 1750.
The Fisherman's Aneroid Barometer, as supplied to the Royal National Lifeboat Institution.
The Marine Aneroid Barometer, as supplied to the Shipwrecked Fishermen and Mariners' Benevolent Society.
Telescopes as used by Pilots, Whalers, Captains, and others; also those supplied to the Trinity service for use on board all Light Ships and in all Light Houses.
Sextants.
Artificial Horizons.
Night Binoculars.
An Electric Ship's Log, by means of which the speed of a ship

**ANDERSON, ABBOTT, AND ANDERSON'S**
**FISHING HATS AND SOU'-WESTERS**
**ARE THE BEST.**
**37, QUEEN VICTORIA STREET, LONDON, E.C.**

**DOLLOND & CO.**—*continued.*

through the water is registered on board in any number of places at the same instant.

Liquid Compasses for small craft.

Deep-Sea Thermometers.

Electric Anemometers.

291. **UTLEY, THOMAS,** 79 Cameron Street, off Needham Road, Liverpool.

Two Deck Ventilators.

Hatch Combing Ventilator.

Model of Hatchway fitted.

Port-hole Ventilator.

Stoke-hole Ventilator.

Amidships State Room Ventilator.

292. **THOMAS, E. C. G.,** National Club, Whitehall Gardens.

Marine Motor for Electric Light on Vessel or Buoy. By an accumulator the work of 24 hours is stored for use at night. Connection is made and broken automatically at sunset and dawn.

293. **JACK, JAMES D.,** Manager, Newmill Ironworks, Elgin, N.B.

Net Hauler and Capstan Combined (Hand Power).

For Hauling Nets used on Herring Fishing Boats and others, setting up the Masts, Sails, &c., with friction appliance for paying out nets in rough weather.

294. **PAIN, JAMES,** 1 St. Mary Axe, London, E.C., Works, Mitcham, Surrey.

Red Meteor Rockets for Signalling.

Green Meteor Rockets for Signalling.

White Meteor Rockets for Signalling.

Pain's Patent Coloured Lights. Various colours.

Coloured Lights shooting out a number of Stars.

Pain's Patent Distress Signal.

Board of Trade Regulation Rockets.

Flannel Cartridges.

Various Signals.

Rockets for Explosive Charges, as supplied to Hon. Trinity Corporation and Irish Lights.

Blue, Red and Green Lights.

Meteor Rockets as used by National Lifeboat Institution, &c.

S. & H. HARRIS'S
WATERPROOF
HARNESS
COMPOSITION.

Sold by all Dealers throughout the World.

5. **PICKWELL, ROBERT**, Civil Engineer, Bowlally Lane, Hull.
Three Self-Registering Ships' Compasses and Stands complete. Keeps an exact record of every steered course, and duration of all courses, &c.

6. **LEEMAN, JOSEPH**, Aberdeen.
Model of an "Automatic Ships' Boat-Releasing Apparatus" (patented) whereby both ends are simultaneously disengaged from, and clear of the ship's tackles, the instant the boat is water-borne. There are no hooks to entangle anything, and no setting up of fore and aft lines is required to secure its automatic action.

7. **SELF-OPENING TIN-BOX COMPANY (THE)**, (Griffin's Patents), G. Featherstone Griffin, Manager, 19 Kirby Street, Hatton Garden, London, E.C.
A Collection of Tin Boxes, Cases, &c., for preserved fish, which can be opened in a moment without cutting or damage to the boxes or their contents.

298. **ARCHER, THOMAS, JUN.**, Dunston Engine Works, Gateshead-on-Tyne.
Archer's Patent Self-holding Steering Gear. Self-holding against any force on the rudder by means of differential gear, whereby the steersman is relieved from the danger of back-lash on the wheel, and whereby the true course of the vessel is maintained. Suitable for Steamers, Tug Boats, Fishing Boats, or Life-Boats.
Also Archer's Patent Compressors or Stoppers and Winches for holding wire hawsers.

299. **MACDONALD, JOHN H. A.**, 15 Abercromby Place, Edinburgh.
Holophote Course Indicator for Ships (Electric), enabling a ship by sweeps of a reflector, to indicate what helm she is on to approaching vessels. An automatic electric controlling gear ensures that the light cannot be swept round, except in accordance with the course being steered.

300. **DAVIS, JOSEPH, & CO.**, Fitzroy Works, Kennington Park Road, London, S.E.
Royal Polytechnic Barometer, in which is incorporated the Admiral Fitzroy's "Prize Medal" Barometer, simplified and improved.

THE ROYAL
FISHING & YACHTING BOOTS FOR LADIES,
*AS MADE EXPRESSLY FOR HER MAJESTY THE QUEEN.*
ANDERSON, ABBOTT, & ANDERSON, 37, Queen Victoria Street, E.C.

**DAVIS, JOSEPH, & CO.**—*continued.*
A Collection of Ditto, in various Patterns and Woods.
Marine Barometers.
Aneroid Barometer, specially made for fishermen.
A Collection of Aneroid Barometers.
Compasses.
Telescopes and Marine Glasses.
Salinometers and Specific Gravity Tests.
Thermometers and Scientific Instruments.

301. **PEACOCK & BUCHAN,** Southampton and London.
Anti-fouling Composition for Fishing Vessels' Bottoms.
Ready Mixed Paint for Sea Stores.

302. **FRASER, A. B., & CO.,** 6 New Quay, Liverpool.
Patent "Acme" Fresh-water Distilling Apparatus, suitable for Troop, Passenger and Cattle Ships, Whaling and Deep Sea Fishing Vessels. Sanctioned and approved by the Board of Trade.

303. **CORNWALL, COMMITTEE FOR.**
Fisherman's Cottage.
Model of Light House.
Anchors, &c., &c.

304. **MORRISON, WILLIAM, & SONS,** Engineers, Jane Street, Leith, Scotland.
Patent Improved Steam Apparatus for hauling and working the nets of fishing boats.
Two Patent Net-hauling Machines for hand use.
Two Masthead Blocks for Wire Rope.

305. **DREW & CADMAN,** 245 and 246 High Holborn, London.
Glass Lenses, bulls'-eyes cut in prism for ships' lamps and signals, Glasses for Barometers and Compass Cases, Cut and Polished Deck Lights in metal frames. Fish Aquariums and Water Tanks in metal frames and plate glass. All kinds of Plain, Ornamental and Bevelled Mirrors in metal frames for cabins, Saloons, &c. All kinds of Glass Show Cases for preserving or display of stuffed fish. Books, Fishing Tackle, &c., specially prepared for hot and cold climates.

**The Luxury, Practical Utility, Originality, and Individuality of**

*TAILORING for LADIES and GENTLEMEN,*

BY

**B. BENJAMIN AND SONS,**

**Ulster House, Conduit Street, W.**

**LIARDET, JOHN EVELYN,** 8 Breakspears Road, Wickham Park, Brockley, S.E.

Four Fluked Hinged Anchor, 12 cwt.
Three Fluked Hinged Anchor.
Automatic Mushroom Hinged Anchor, 10 cwt.
Spring and Double-Acting Windlass, for all Trawlers, Tugs, and other Ships, to be worked by steam or hand power.
Towing Spring with Hook, 60 lbs.
Four-Bladed Propellers, 50 lbs.
Six-Bladed Propellers, 50 lbs.
Electric Warning, to alarm when ship is on her course. Port, or Starboard, one Bell to ring when ship's course is Port and two Bells or a Gong and Bell to ring when ship is on Starboard course, to be acted on by the action of the rudder, to prevent collisions at sea or in foggy weather.
Ship's Log.
Boat Lowering Gear and Disengaging Gear.
Spring Link for taking off the snapping and breaking of Cables, Hausers, Ropes, &c.

MR. LESLIE LIARDET:
Boat Detaching Gear.

**WILSON ENGINEERING COMPANY,** Holborn, London.

Stoves for Yachts and Ships.
Fish-Cooking Utensils.

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## DIVISION VII.

**Models of harbours, piers and slips, for fishing purposes.**

**MACKENZIE, R.,** Master of Works, Campbeltown, Argyleshire, N.B.

Model of Harbour and Pier.
Plan of Harbour and Pier.

**LIARDET, JOHN EVELYN,** 8 Breakspear Road, Wickham Park, Brockley, S.E.

Drawings of Harbours of Refuge.

**GREAT EASTERN RAILWAY COMPANY,** A. A. Langley, Chief Engineer, Liverpool Street Station, E.C.

Model of Lowestoft Harbour and Fish Markets.

The Best and Cheapest. First Established 1825.
NEAVE'S FOOD FOR INFANTS AND INVALIDS.
IN ONE-POUND ONE SHILLING CANISTERS.
SOLD EVERYWHERE. WHOLESALE OF THE MANUFACTURERS,
J. R. NEAVE & Co., Fordingbridge, England.

310. **STUART & CO.**, 8 Thomas Street, Edinburgh, and Church Row, Limehouse, London, E.
Patent Granolithic Steps for Harbours. More durable than stone, and can be made at about half the price. Tensile strain, 355·55 lbs. per square inch. Leverage strain—Granolithic step carried 1 ton 13 cwt., without breaking; Craigleith stone step broke with a load of 12¾ cwts.

311. **ABERDEEN HARBOUR COMMISSIONERS,** per William Smith, Harbour Engineer, Aberdeen.
Model of Harbour constructed of timber and glass.
Four cases, photographic views of Aberdeen Harbour.

312. **TAYLOR, ALEXANDER,** Boat Builder and Fish Curer, Sandhaven, Fraserburgh.
Model of Sandhaven Harbour (County of Aberdeen), scale of 1 inch to 20 feet.

313. **LEEDS, LEWIS W.**, 38, Old Jewry, London, E.C.
Models of floating harbour for fishery purposes.
Method of breaking the force of sea at entrance of Harbours, and elsewhere.
Means of communication from Shore to Light Ships and Fishing Fleets.

314. **KNOWLES & KNOWLES,** Zebu Works, Southcoates, Hull.
Model of Dock or Harbour.

315. **LUMSDEN, CAPTAIN ROBERT,** 12 Maiden Street, Peterhead.
Model of Peterhead Harbours and Bays, showing plan for Harbour of Refuge in South Bay.

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DIVISION VIII.

**Fishing tackle and netting in different stages of preparation, and machinery used for working up the raw material.**

316. **CRAGG, J. S.**, Net Manufacturer, Lowestoft.
Fishing Nets and Fishing Twines.

317. **MANCHESTER COTTON COMPANY,** 51 Corporation St., Manchester.
Fishing Net.

ANDERSON, ABBOTT, & ANDERSON'S
LAWN TENNIS
REQUISITES.
37, Queen Victoria Street, London, E.C.

**HAYWARD, R., & SONS,** West Chinnock Mills, Somerset.
Sail Cloth, Twine, &c.
Spun Lines in the different stages of preparation.

**SMEETON, GEORGE FRED.,** Stoney Royd Mills, Halifax, Yorkshire.
Twines made of cotton, suitable for nets and other purposes.

**SUGDEN & FAULKNER,** Lords Chambers, Corporation Street, Manchester, and Granville Mills, Walkden, near Bolton, Cotton Doublers, and Manufacturers of all kinds of Cotton Fish Net Yarns.
Collection of samples of Fish Net Yarns.

**OWDON, JAMES, & CO.,** Fish Merchants, Fraserburgh, N.B.
Model of apparatus for barking nets by steam.

**COTT, DAVID,** Kinnaird Head Lighthouse, Fraserburgh.
Apparatus for tightening backropes of herring nets.

**UNTER, H. L.,** 66 Cressingham Road, Lewisham, London, S.E.
Preservation of Nets and Tackle from Rotting.

**ONES, W.,** 10 Eastbro, Scarborough.
Model of Apparatus for Tanning, Tarring, &c., for fishing nets, warps and gear, with specimens of goods which have been subjected to the above method.
Samples of Hemps used in making fishing lines and twines and ropes, as imported, also dressed and manufactured.
Model of an Improved Herring Net.
Model of an Improved Trawl Net.
Model of Apparatus for Tanning, Tarring, &c., for fishing nets, warps and gear, with specimens of goods which have been subjected to the above method.

**AMES, HENRY,** 20 and 21 Windley Factory, Nottingham.
Frame plaiting machines making fish line.

**EGETMEIER, WILLIAM B.,** *Field* Office, 346 Strand, W.C.
An educational series, showing the various knots and contrivances employed in the arts of netting and braiding and in the construction and repair of the various nets used in marine and fresh-water fisheries.

**ANDERSON, ABBOTT, & ANDERSON'S**
Waterproof GUN COVERS,
GAME BAGS,
CARTRIDGE BAGS, are the best.
37, Queen Victoria Street, London, E.C.

328. **EDGINGTON, BENJAMIN,** London Bridge Works, E.C.
Tents and Clothing.

329. **SAMSON, GERARD, & SON,** Grove Iron Works, Bridport, Dorset.
Loom for making Fishing Nets.

330. **HELYEAR, THOMAS,** West Street, Bridport.
Machine for manufacture of nets for Mackerel, Pilchard, or Herring fishing.

331. **HARRISON, W.,** Manchester.
Machine for making Nets.

332. **BARBOUR, WILLIAM, & SONS,** Hilden Flax Mills, Lisburn, Ireland.
Hemp and Flax Netting Twines.
Linen Threads for Net Making.
Salmon Netting Threads.
Sturgeon Twine for Net Making.
Gilling Threads.
Best Irish Flax Threads for Net Making.
Seaming and Roping Twines.
Seine Twines.
Linen Yarns.
Hemp Yarns.

333. **RUSSELL, CAMERON,** 30 Little Trinity Lane, Queen Victoria Street, London, E.C.
Fisherman's Watching or Camping Box, dressed for cold or damp climates. Simplicity of construction, erection, durability, lightness and cost.
Ditto in Pure Flax, with fly and special jointed rush poles for hot climates. Also Sailcloth, &c.

334. **STEPHEN, W., & SONS,** Seal and Whale Fishers, and Tunners, Marine Parade, Dundee, and St. John's, Newfoundland.
Case showing sealskins dressed as leather and furs, and ornamented by stuffed specimens of Arctic animals, with the implements used in the capture and dressing of same. Also specimens of seal, whale and porpoise oils, whalebone, and other produce of seal and whale fisheries.

335. **WOODWARD, T. B.,** Hackins Hey, Liverpool.
Three Boxes of Cutch, in boxes as imported from Rangoon.

**ANDERSON, ABBOTT, & ANDERSON'S**
**FISHING WATERPROOFS**
**CANNOT BE EXCELLED.**
37, QUEEN VICTORIA ST., LONDON, E.C.

## DIVISION IX.

**Lifeboats, their equipment, and life-saving apparatus of every description.**

** In Life Boat Gallery, immediately to the north of, and parallel with, the British Deep Sea Fisheries Gallery.*

**GRAY, J. W., & SON.**
"Whitby" Patent Day and Night Life-buoy for use on steamers and yachts.
Model showing Internal Sections of the Buoy. The "Whitby" Buoy, made in twelve water-tight compartments, has a buoyancy capable of supporting four people. When released a wire running through a tube is detached, and on its reaching the water ignition takes place. The Buoy is also fitted with flags, whistle, and a flask for stimulants.

**DENT, EDWIN,** 6 New Saint Mark Street, Dansome Lane, Hull.
Model of Lifeboat about 20 inches.
Life Belt (model) with an arrangement for keeping crews together in case of wreck.

**YOUNG, LAMBTON,** C.E., 16 Harcourt Terrace, Redcliffe Square, S.W.
A glass case containing two models of life-saving surf boats to do duty off coast bathing places for protection of bathers. These 16-ft. boats will, when full of water, support 12 people in safety, and can be managed by one man with ease.

**SIMON, JOHN,** Rue Ponderense, St. Martin, Guernsey.
Model of Lifeboat or Fishing boat.

**BOYD, WILLIAM,** F.R.S.E., Peterhead, N.B.
Model of the raft constructed for saving life on the occurrence of the wreck of the French frigate "Medusa," with shears, sail, and steering apparatus adapted to it for the purpose of showing how a raft suitable for the rescue of a shipwrecked crew may be steered. With stand.

1. **TRAVERS, JASPER,** Courtmacsherry, County Cork.
Model of Lifeboat, with new design for propelling same.

2. **ACHESON, JOSEPH,** Ballyane Park, New Ross, Co. Wexford.
Model of Fisherman's Lifeboat. Any and every open boat can thus be easily and cheaply made *unsinkable;* being bulk-

INDIA-RUBBER DECK BOOTS
*OF EVERY SIZE AND DESCRIPTION.*
**ANDERSON, ABBOTT, and ANDERSON,**
*37, QUEEN VICTORIA STREET, LONDON, E.C.*

**ACHESON, JOSEPH**—*continued.*

headed and decked, level with thwarts, air-tight, bow and stern. Fishing boats thus fitted can be used for saving life from ships in distress, carrying double weight of persons, even when full of water.

343. **GRIFFITH, REES MORRIS,** Bridlington, East Yorks.

Model—Griffith's Folding Life-Saving and Transporting Raft, in seven sections so as to take up a quarter the room when not in use, each section is an air chamber, with india-rubber tubing as extra buoyancy. For use on passenger and other ships in case of fire, collision, &c., where dispatch is important, everything required for propelling, &c., folds up with it.

344. **HEDGCOCK, F. J.,** 34 Great Ormond Street, Queen's Square, London.

Model of Life-saving Raft, used as locker and seat; especially adapted for use on mail and emigrant vessels, can be kept provisioned and supplied with life-buoys, swing compass, sail and rocket-tube, ready for immediate use. When not required as a raft, forms a useful locker and seat. When required for use the sides are folded out and the stretchers fastened across, at once producing a raft of simple adaption and enormous floating power. Certificate of merit, Life-Saving Appliance Exhibition, Alexandra Palace, 1882.

345. **HUMBLE, WILLIAM, & SON,** Limekiln Shore, North Shields, Northumberland.

Cork Life Buoys.
Cork Life Jackets.
Life-boat, framed with wood, and built of cork, 1¾ inch from keel to gunwale, with air-tight deck and ends, has four tubes, which makes her unsinkable.
Long Line Floats.
Cork Folding Chair.
Cork Fenders.

346. **HAMBLIN, NATHANIEL, JUN.,** 57 Bow Lane, Poplar, London, E.

Model of a Life-boat, self-righting, fitted with provision tank, fresh-water tank, partly ejecting water from her. Air

The Best and Cheapest. First Established 1825.
NEAVE'S FOOD FOR INFANTS AND INVALIDS.
IN ONE-POUND ONE SHILLING CANISTERS.
SOLD EVERYWHERE. WHOLESALE OF THE MANUFACTURERS.
J. B. NEAVE & Co., Fordingbridge, England.

**MBLIN, NATHANIEL, JUN.**—*continued.*

buoyancy easily removed in event of damage to boat, or thrown overboard to assist others floating, for the use of ships, yachts, or otherwise.

**ASDEL, WILLIAM,** C.E., Harbour Works, Great Yarmouth, orfolk.

Model of Lifeboat.
Model of Surf Lifeboat.
Model of Sailing Lifeboat and Carriage.
Model of Lifeboat Carriage.
Model of Punt for laying anchor for getting off Lifeboat.
Model of Lifeboat with increased stability and buoyancy.

**HARIE & ADAMSON,** 7 Lawrence Street and 3 Nile treet, Sunderland.

Two models. One ship's Lifeboat built of wood, cork and india rubber.

One shore Lifeboat for shore purposes, built of wood, cork and india-rubber, both on our patent principle.

One Ship's Lifeboat unsinkable and unstaveable, built of wood, cork and india-rubber.

**SLIE, W., & HAMBLIN, N.,** Boat Builders, New Road, Blackwall.

Lifeboat for ship or coast. Self-righting in seaway, unsinkable; ejection of water when swamped to water line. Oars, mast, sail, &c. Life-belts as gear for above boat.

Fresh water fishing Punt, fitted with buoyance, if swamped not to sink.

**RITISH & FOREIGN BOAT-LOWERING COMPANY,** 6 Great Winchester Street Buildings, Old Broad Street. London Agents, Scrutton & Campbell, West India Dock Road, Limehouse, E.

One large model of Lifeboat, and two small toy models of Lifeboats.

This gear provides for instantaneously connecting or disengaging the boat.

**EAN, ELIZABETH,** Godwin Road, Hastings.

Life Boat, Surf Boat, or Wave Boat, to pass through waves without losing its equilibrium.

**ANDERSON, ABBOTT, & ANDERSON'S**
**ONCHO WATERPROOF**
Affords absolute protection when Riding. Much used in Brazil and other Tropical Countries.
**Also makes an excellent Ground Sheet.**

**DEAN, ELIZABETH**—*continued.*

Life Raft for shore communication.
Surf or Life-boat.
Model of a Fish Carrier, for preventing loss of life in transhipping fish in the North Sea, or other fisheries.
Steam Fender, attached to ship, to lessen damage caused by collision at sea.

352. **LOW & DUFF,** Albert Machine Works, Dundee.

Four Guns for firing lines from stranded vessels to shore, or from shore to vessels in like position; also for firing from life-boats to wrecked vessels; also from tug-boats to vessels requiring towing; also for communicating between two vessels at sea when not possible to approach near each other; also for firing lines to persons in upper flats of burning houses, and for any other purpose whatever where quick communication by line is desirable.

353. **WENTWORTH, Messrs.,** 12 Museum Street, London, W.C.

Sole Manufacturers of the "Kredemnon" Life-saving garments and belts, for men, women, and children. Also of the "Sauve qui peut" combination suits for bathing, boating, wading, sleeping, and transfer service, and of other Life-saving garments made up in any prevailing fashion. Buoyancy ensured while additional weight is scarcely perceptible.
Unsinkable clothing for fishermen, &c.

354. **FORRESTT & SON,** Norway Yard, Limehouse, and Britannia Yard, Millwall, London.

Full size Coast Life-boat.
Life-boat for conveyance of fish.
Patent Life-raft.
Model of Steam Tug.
Rowing Coble.
Model of Boat, with Improved Sailing Gear.
Model of Fishing Boat for East and Scotch Coasts.
9 ft. Fishing Dinghy.
10 ft. Fishing Dinghy.
12 ft. Fishing Dinghy, with centre board.
Improved Life-Boat for Steam Fish Carriers and other vessels.

THE IMPROVED
**VENTILATED FISHING JACKETS,**
MADE ONLY BY
**ANDERSON, ABBOTT, & ANDERSON.**

355. **SEXTON, JOSEPH,** 3 and 4 Great Winchester Street, London, E.C.

Patent Buoyant Deck Seat, with Cushions, full size; when free from deck becomes three life-saving floats. Will sustain eight or nine persons, designed for Channel Steamers and Yachts.

Buoyant Bathing Dress, easily applied to any shape of dress, and at small cost.

Collection of Life Saving Appliances.

356. **COPEMAN, E. S.,** Downham Market, Norfolk, and 4 Victoria Street, Westminster, S.W.

Model of raft, on a platform two feet above main platform with tanks 8 ft. 6 in. by 7 ft. 2 in. Water in tank.

Copeman's Patent Seat Raft. Two specimens of deck seats for saving life in case of accident on board passenger vessels. These seats placed together form a raft or life-boat capable of carrying ten or fifteen persons on board, and are supplied with mast, sail, oars, water and provisions. The buoyancy of each seat is upwards of half a ton, and singly or together they will support fifty or sixty persons in the water, with provisions and means of signalling.

. **BEECHING BROTHERS,** Ship and Boat Builders, Great Yarmouth.

Model of Lifeboat, with equipments.

. **ROPER, RICHARD,** 143 Lewisham High Road, New Cross, S.E.

A Working Model, scale 1 in. to 1 foot, represents the midship section of a large ocean-going steamer or troopship, fitted with self-launching bridge life-rafts, with fluted bottoms, built on the cellular principle.

A similar model with a different method of launching. This raft is suitable for fish-carrying steamers. The top of the deck-house is fitted with a self-floating raft.

A similar model $\frac{3}{4}$ in. scale to 1 ft., with different method of launching, showing how tops of charts, deck-houses, &c., can be fitted with self-floating rafts.

Raft fitted up for troopship for saving life, landing horses, guns, cargo, &c. Scale $\frac{3}{4}$ in. to 1 ft.

*ANDERSON, ABBOTT, & ANDERSON'S*

**PORTABLE INDIA-RUBBER BOATS**

**For Fishing, Shooting, Exploring, and Pleasure Purposes.**

**37 QUEEN VICTORIA ST., LONDON, E.C. Works: LIMEHOUSE, E.**

**ROPER, RICHARD**—*continued.*

Life raft, fitted with a raised cabin, suitable for emigrant ship, showing the masts, sails, &c., complete.

Tubular raft, fitted complete, showing the method of constructing them on the tubular principle. Scale ½ in. to 1 ft.

Model of a passenger steamer 4,060 tons, scale ¼ in. to 1 ft., fitted with three rafts, one in front of poop, one in front of forecastle, and one as captain's bridge. Capable of saving the lives of the most crowded passenger ships.

Model of the "Princess Alice," fitted with Roper's floating rafts capable of carrying 960 persons.

Half-model of "Princess Alice," showing the after part, after the collision with the "Bywell Castle," fitted with Roper's self-floating rafts; will be sunk in tank showing the action.

Models showing the different construction of the life rafts.

Life Raft, showing it fitted complete, with sails, masts, rigging set, with water-tight seats, containing water, provisions, signals, rockets, compass, charts, oars, &c., and sitting accommodation for 450.

Midship section of a steam or sailing ship, with deck-house fitted with Roper's self-launching life-raft, fitted complete. Scale 1 in. to 1 ft. With semicircular launching ways and telescopic extension.

The whole of the above models are unsinkable, and will be launched in a tank.

359. **ROSE, R., & CO.**, 72 Leadenhall Street, London.

Patent Oil Discharging Apparatus.
Patent Deck Seat for supporting 50 people.
Patent Fowl Coop Seat.
Small Deck Seat for Yachts.
Sea Messenger, Life Buoy and Seat Combined.
Life Belt Cushions and Beds combined.
Models of Various Life-Saving Appliances.

361. **HILL & CLARK**, 6 Westminster Chambers, London, S.W.

Life-saving Apparatus consisting of models of life and other boats fitted with methods for lowering and disengaging

The Lightest Waterproof Garments ever made.
ELEGANT, DURABLE, & CHEAP.
Complete Suit of Hat, Coat, and Leggings,
Weighs only 11 oz.
PRICE 30s.
THE LEVE ANTIPLUVIUM.
SOLE MANUFACTURERS.
37, QUEEN VICTORIA STREET, LONDON, E.C.
ANDERSON, ABBOTT, & ANDERSON.

**HILL & CLARK**—*continued.*
them from ships at sea; also plan as fitted to whaling ships' boats for getting boats quickly and quietly away after the fish. Working models to be seen in action.

**BAKER, J. M. B.**, Hammersmith, London, W.
Ocean Courier.

**EMERY, LEWIS**, Sherringham, Norwich.
Model of Life-boat.

**HOLMES, NATHANIEL J.**, 8 Great Winchester Street, London.
Life-Saving Equipments.
Mechanical Compound Reed Foghorns.
Life-Buoy Rescue Light.
Shipwreck Distress Flare.
Collision Light and Boat Launching Flare.
Torpedo Finders.
Fish Decoy Light.
"Raba," the Fish Preserver.

**WILLIAMS, A. H.**, 1 St. Mary's Road, Peckham, London.
Samples of a Patented Pontoon or Air Vessel, which can be packed or stowed away in an incredible small space, to be used in rafts for saving life at sea. Also for preventing vessels from sinking; also for raising sunken vessels, &c.

**KING, J., & CO.**, Boat Builders, Three Colt Street, Limehouse, E.
Copper fastened Life-boat complete, fitted with yellow metal, air-tight buoyancy, Hill & Clarke's lowering gear as supplied for emigrant ships, with oars, mast, sail, water breakers, bailers, &c.
Yacht Dinghy. Copper fastened, planked with Mahogany, Brass Rowlocks and Yoke, Balance Lug Sail, Mast, Oars, &c.

Smacks Dinghy. Copper fastened, Frame of English oak, planked with English elm, Oars, Mast, Yard, Lug Sail, Rowlocks, &c.
Steam Launch Punt. Copper fastened, Frame of English oak, planked with English elm and fitted with Mahogany internal fittings, Balance Lug and Sliding Keel, Mast, Oars, Gun Metal Rowlocks and Yoke, &c.

SHOES WITH RUBBER SOLES
FOR
*LAWN TENNIS, BOATING, YACHTING, and GYMNASTICS.*
**ANDERSON, ABBOTT, & ANDERSON,**
87, QUEEN VICTORIA STREET, LONDON, E.C.

368. **TIMMIS, ILLIUS AUGUSTUS,** 17 Great George Street, Westminster, S.W.

A ship's boat that is unsinkable and reversible, and so acts as a lifeboat or as a life raft, and that can be stowed at davits in the ordinary way, or launched from a ship without any davits. It also is the best means for using with rocket apparatus, and is pulled to a stranded or wrecked ship through any sea, and cannot be stove in or swamped. It also serves for a pontoon raft for landing troops, &c.

369. **LIFE BOAT INSTITUTION, THE ROYAL NATIONAL,** 14 John Street, Adelphi, London.

Life-boat (self-righting), full size, on transporting carriage.
Model of Life-boat (self-righting), on transporting carriage.
Model of first English Life-boat.
Model of same as modified and now in use.
Model of Norfolk Life-boat.
Model of Tubular Life-boat.
Model of Safety Fishing Boat.
Model of Boat-house and Boat.
Tank with working models.
Large Life Belt.
Seaman's Life-Belt.
Self-acting Valve.
Rowing Crutch.
Life Buoy.
Telescope.
Loaded cane and line.
Compass.
Verey's Pistol and Cartridges.
Model drogue.
Set of mounted instructions.
Wreck Chart, Drawing of Life-boat House and Working drawings.

370. **BRADFORD, W. H.,** Great Saughall, near Chester.

Large ocean Sailing Life-Boat, Iron. Uncapsizable. Dome principle. Could be adapted for steam, and to go to a wreck in the roughest weather.

Ships, on deck, tumble overboard Life-raft. Reversible

ANDERSON, ABBOTT, AND ANDERSON
ARE THE MANUFACTURERS OF THE
ARMY REGULATION VALISE.
37, Queen Victoria St., London, E.C. Works: Limehouse.

Messrs. Anderson, Abbott & Anderson, [COPY.] Horse Guards, 12th June, 1871.
The Valise made by your firm has been found well suited for the conditions proposed, viz., to enable an officer to carry the articles absolutely required for service; and the waterproof sheet answers as a bed; the whole, fittings included, not exceeding forty pounds weight. The pattern has been deposited at the Horse Guards for inspection.—Arthur Herbert, A.A.G., Col.

**BRADFORD, W. H.**—*continued.*

Catamaran principle. Cylinders of same, ordinarily, for fresh water storage.

Illustrated wood-cuts of Boat-lowering Apparatus.

**EDINBURGH, H.R.H. THE DUKE OF, K.G.,** Clarence House, St. James's, London, S.W.

Models of Life-boats which were presented for service in the Baltic and Black Seas by the English inhabitants of St. Petersburgh upon the occasion of the marriage of His Royal Highness.

**DYER & ROBSON,** East Greenwich, London, S.E.

Show case showing new method of throwing a line for rope.

Show case containing Signalling Apparatus, Rockets, &c., including Very's Patent Signalling Pistol and Cartridges.

Life-saving Apparatus.

**STEEDMAN & McALISTER,** Cathcart Street, Glasgow.

Life Buoy cut in two to show solidity of article.

Life Buoy to Board of Trade requirements uncovered.

Life Buoy to Board of Trade requirements finished.

Life Buoy, ordinary size.

Life Buoy, oval pattern.

Life Buoy, yacht size.

Life Buoy, small yacht size.

Lifeboat Jackets to Board of Trade requirements.

Life Belts, different patterns, for fishermen and passengers.

Cork Mattrasses and Pillows.

Improved Life-saving Seat with detachable cushion.

Patent Bed or Cot, and a few small articles of similar nature to above.

**WILKINS, WILLIAM,** Queen's Road, Tunbridge Wells.

A Life-preserving Atmospheric Helmet and Atmospheric Belt (with safety compartments), to support and protect the head from the overwhelming effect of the wind, foam, and waves of a rough sea.

WATERPROOF CANVAS

**BAGS, HOLDALLS, AND KNAPSACKS**

of every description for Travellers and Sportsmen.

ANDERSON, ABBOTT, & ANDERSON,

37, QUEEN VICTORIA STREET, LONDON, E.C.

375. **WARD, ALFRED,** Kilburn Baths, Kilburn, London, N.W.
Several life-saving dresses.

376. **DAVIS, H. F.,** 75 Bayham Street, Camden Town, London.
Two Mermaid Life Belts, one in dispatch case for gentlemen, and one in canvas bag for seamen, &c.

377. **ROGERS, JOHN BANTING,** Richmond House, Holloway Road, London, N.
Life-saving Apparatus. Model Cart, Mortars, Projectile Anchors, Cone Block Shot to throw Rove Rope or Messenger Line, Signal Gun and Rocket Signals for night. Boat-lowering apparatus, Slip catch and hook, and other models appertaining to saving life on sea and land. Models complete and full size.
Some Drawings showing a "method by which vessels cannot be injured by torpedoes." Also Drawing of "Shield for Ram to protect vessels from being injured in times of peace."

378. **GRAY, J., & SON,** 153, Edgware Road, London, W.
Samples of Life-saving Waistcoats of the same description.

379. **WOOD, JOHN WILLIAM,** 34 Great St. Helens, London, E.C.
A set of Wood's patent self-adjusting Rivet-hole and Leak stoppers, in seven different sizes, with illustrating plate. For instantly stopping holes and leaks in ships, buoys, boilers, torpedo-boats, &c., from either inside or outside.

380. **BALLARDIE, D.,**
Life-Saving Apparatus.

381. **HAMMOND, R. C.,** 11 Stourcliffe Street, Edgware Road, London.
Swimming Plates on Colonel Dunlop's Patent.

382. **BIRT, J. & A. W.,** 42 Dock Street, London Docks, London, E.
Collection of Marine Life-saving Appliances, applicable to all classes of vessels.
Life Belts of various descriptions.
Life Buoys of various descriptions, with mode of construction.

The Collection of Life-saving Appliances which gained the Gold Medal of the Royal Society of Arts, showing how to

LIFE BELTS. **J. & A. W. BIRT,** LIFE BUOYS.
*Manufacturers of Marine Life Saving Apparatus,*
**DOCK STREET, LONDON, E.**
To the Admiralty, Board of Trade, Life Boat Institution, and the principal Ship Owners and Builders.
Life Belts, Life Buoys, Rocket Life-Saving Apparatus, Life-Saving Mattresses, Cork Cushions, &c.
Awarded the Gold Medal of the Society of Arts for the best means of saving life at Sea, and the Fifty Guinea prize at the Naval Exhibition at the Agricultural Hall and Prize Medals at all the principal Exhibitions.

**BIRT, J. & A. W.**—*continued.*

utilize articles already on board ship (see Parliamentary Paper) viz.:—

For Men of War—Hammock and Berth Mattresses.

For Troop Ships—Soldiers' Belts with the Mess Tables forming Rafts (now under consideration of the Admiralty).

For Merchant Ships—Berth Mattresses, Gunwale Buoys, Cushions and Seats.

For Passenger Steamers—Seats, Cushions, Stools, and Gunwale Buoys.

Models for examination in Seamanship and the Rocket Apparatus.

Articles specially designed for Fishing Craft.

Life Belts for Fishermen, to be worn when boarding.

The Cabin Ladder made buoyant and utilized for life-saving purposes.

The Cover Over-all of Ice and Fish Room made buoyant and utilized for life-saving purposes.

The Cover Over-all of Forecastle Hatchway made buoyant and utilized for life-saving purposes.

**ATKINS, WILLIAM, & ELIAS PARSONS,** Lime Cottage, Battersea Rise, London.

Boat Lifting Apparatus.

Stand for Water Tank.

Water Tank.

Two Stands for Wood Models.

Model in Glass Case.

Steel Oval Model, large.

Small Steel Model.

Two Pictures, in wood frames exhibiting working models.

**WAYTHE, WILLIAM E.,** Echline House, Princes Road, Great Yarmouth.

Life-saving Kite, for communication from ship to shore or ship to ship. Made smaller or larger according to the force of wind. To come to shore from a ship on the main with the wind parallel with the coast, to drop at command, and to be worked by one line only. Carrying its own light or lantern by night.

Stop at **BAKER STREET STATION** for

**MADAME TUSSAUD & SONS'**

**EXHIBITION.**

**Admission 1s. Extra Rooms, 6d. Open from 10 till 10.**

385. **LAMBART, LT.-COL. HON. O. G.,** 10 Cliff Parade, Southend-on-Sea.

Life-saving Apparatus. "The Utrinque," principally for collisions or founderings. Easily stowed, always ready for use, has only to be thrown overboard *anyhow*. Provisioned for several days and provided with sail and oar; can neither founder nor upset, nor its inmates be washed out. Not liable to injury by contact with the wreck. "The exhibit" size weighs only 230 lbs., and is amply sufficient for four men.

386. **WRIGHT, JAMES,** 15 Jamaica Road, Bermondsey, London, S.E.

Models of impreved never-failing self-righting Shore Life-boat and Ship's Life-boat, for experimental testing, if necessary, the Shore Life-boat will self-right in all weathers, with sails set and sheets fast.

Also specimen model of Shore Life-boat.

387. **WOOLFE, F. W., & SON,** 46 Lower Shadwell, and Middle Shadwell, London, E.

Unsinkable Ship's Lifeboat, 25 ft. long by 7 ft. beam, constructed for use on board passenger ships; fitted with movable air-tight cases on each side and fore and aft, to carry twenty passengers, independent of her crew.

Model of Unsinkable Ship's Lifeboat in glass case.

389. **METEOROLOGICAL OFFICE.**

Collection of Meteorological Instruments from various countries.

390. **BRASSEY, LADY,** Normanhurst Court, Battle, Sussex.

Model of a Viking Ship the "Ellida." So named by Lady Brassey after one of the most famous Viking vessels.

The model exhibited, a yacht's gig, represents in the details of her structure, the great "Viking" Ship. It was adapted by the Marquis of Ailsa, and built at the Culzean Yacht and Steam-Launch Works, Maybole, Scotland. The original was discovered in 1880 at Gokstad, near the town of Sandefjord, west of the mouth of Christiana Fjord, a farm on a peninsula in Norway. The great interest attached to it is in consequence of it having been one of the burial war-ships in which noted men, according to tradition, were interred during the 9th, 10th, and 11th centuries after Christ. This mode of burial has proved of great importance to archæologists, since on excavating some of the grave-mounds in which it was adopted, ships from that remote period have been brought to light in a more or less perfect state of preservation. The period is the later Iron Age or "Viking" Period. It rarely happens that grave-mounds consist of a substance in which wood can be preserved for centuries, but this ship (like one other, found in the parish of Tune in 1867,

**ANDERSON, ABBOTT, AND ANDERSON'S**
*Waterproof Riding Aprons & Hunting Leggings, and Valises.*
**37, Queen Victoria St., London, E.C.**

**BRASSEY, LADY**—*continued.*

between the Christiana Fjord and the Swedish frontier) seems to have been buried in a mound of blue-clay, a species of earth specially selected for its excellent qualities as a preserver of wood. It was excavated by Mr. Nicolaysen, and now belongs to the collection of antiquities in the University of Christiania. The original is 77 ft. 11 in. in length, as she now stands; a few pieces of the woodwork, wanting in the original, have been supplied after a careful study. These restored parts are distinguished by a different colour.

The ship is entirely of oak, clinker-built, the boards connected with iron nails, and the seams caulked with oakum, made of cows' hair spun into three-stranded cord. The planking is about one inch thick.

Both oars and canvas were used to propel her. Of the former there were sixteen on either side, so that thirty-two men would thus be required to serve the oars only; and doubtless the full complement would not be less than forty hands. There has been no true deck, only loose boards cut into the frames. The tent cloth is made of a fine woollen texture, whilst the cords for fastening are of hemp. The pieces of ships' rope, of which a good many were found, are of bast. The rudder is hung by a rope a little forward of the sternpost on the right-hand side, as usual in all vessels of the Viking Period, and long after, down indeed to the 14th century, hence "starboard" or steering board, the right-hand side of a ship. The method of fastening and guiding this ancient style of side-rudder was not satisfactorily known previous to the discovery of this Gokstad vessel.

In that portion of the ship first opened was found a piece of timber, evidently the anchor-stock, with traces of iron. Also two or three small boats neatly built of oak. Underneath this were the oars, some 20 feet in length, exceedingly interesting through their workmanship. The following other articles were found—

Trace of a landing stage, fragments of sleeping berth, portion of wooden chair and a great variety of kitchen utensils, including a massive copper kettle, wooden plates and drinking-cups, &c.

The grave or burial chamber was built just behind the mast, and was 15 feet square. In this room, which has a gable roof, the remains of the dead were deposited unburnt, and no doubt on a bed, portions of which were found. Robbers had, however, been there, who had dug into the mound, accounting for the fact that the bones had disappeared. No implements of war were found, but a series of miscellaneous articles, including iron fish-hooks and a turned draughtsman of horn in the grave chamber, as well as wearing apparel of gold brocade.

The barrow or mound from which it was excavated was very large and of the usual circular form. The ship was interred in the middle, on her keel, decorated with shields hung close together along the rail on both sides of the vessel. A few of these shields have been restored and placed in position. BRYCE-WRIGHT.

Model of a Chinese Junk. Length, 3 feet 3 inches.

Model of Japanese Boat, in ivory, with boatmen and other figures, upon stand of black lacquer, with leaves and conventional waves in gold. The figures are remarkable for

ANDERSON, ABBOTT, AND ANDERSON,
ARE THE MANUFACTURERS OF THE
ARMY REGULATION CLOAK,
37, Queen Victoria St., London, E.C. Works: Limehouse, E.
HORSE GUARDS, 10th *March*, 1871.—GENTLEMEN,—The Waterproof Coat made by you has been approved of as a pattern for Coats to be worn in wet weather by all Officers. The Material seems excellent, and is exactly what was recommended by the Committee. Your pattern has been now sealed and deposited at the Horse Guards.—I am, Gentlemen, yours obediently,
ARTHUR HERBERT, A.A.G., Col.
N.B.—A General Order on the subject will be issued in next month's orders.

**BRASSEY, LADY**—*continued.*

their expressions and attitudes. Height, 4½ inches; length, 1 foot 10 inches.

Model of Japanese Boat, in bronze.

Model of Japanese Pleasure Boat, in ivory, with four beautifully executed figures. Length, 12 inches.

Model of Japanese Pleasure Boat, the centre covered with a kind of roof. Within are four figures of ladies and gentlemen, with steersman, all exceptionally well modelled and heightened with colour. The details are so far carried out as to include even the three pairs of sandals of the men left outside the covered part on the deck of the boat. Ivory. Length, 14 inches; width, 4½ inches.

Model of Chinese River Pleasure Boat, in ivory.

Model of an Outrigger Canoe from Tahiti, carved in wood.

Canoe, made from the hollowed-out trunk of a tree, from Maitea, South Sea Islands. Length, 8 feet.

Model of a Canoe, made of bark, Fuegian.

Model of an Outrigger Canoe, from the South Sea Islands.

Model of a Raft with Lateen Sail, from Island of Formosa.

Model of Chinese War Junk. Length, 3 feet 4 inches.

Paddle Steamboat. Earthenware, with a dark-brown glaze, from Chanaklesi, Dardanelles.

Model of an Outrigged Surf Boat, Ceylon.

Chinese Boat, model in wood, painted. Length, 2 feet 9 inches.

A Figure of Swan, in silver. From its back spring a mast and sail, and its outstretched wings are freighted with boxes, chests and fans, and a variety of goods. The mast is in imitation of bamboo, the sail divided longitudinally, the divisions diapered in patterns, some being coloured, others gilt. In the centre of the sail is let in a detached crystal ball within a medallion of chased scroll-work. Behind are a rudder and tiller, and the bird floats on a conventional sea. Japanese. 16 inches.

Two Tortoise-shell Boats.

Boat, folding, from "Black Curries."

Model of a Fishing Canoe, with paddles and fishing spear. Fuegian.

Model of Canoe. Fuegian.

Model of Double Canoe, with triangular sails, the position of the canoes being reversed end to end. South Sea.

**D'ALMAINE'S PIANOS.** HALF PRICE. In consequence of a change of partnership, the whole of this splendid stock, perfected with all the improvements of the day, viz., steel frame, overstring trichord throughout check action, &c., is now offered at half price by this long-standing firm of 100 years' reputation, and in order to effect a speedy sale the easiest terms arranged, with 10 years' warranty. Trichord cottages, from hire, £10 to £13,—Class 0, £14; Class 1, £17; Class 2, £20; Class 3, £23; Class 4, £26; Class 5, £30; Class 6, £35; Class 7, £40. American Organs, best class from £7.

Carriage free and all risk taken to any station in England. T. D'ALMAINE & CO., 91, FINSBURY PAVEMENT, MOORGATE, E.C.

LAURENCE, JOHN ROBERT—*continued.*

These Fair Isle Skiffs, though apparently mere cockle-shells, are very buoyant; and it is said to be perfectly wonderful the amount of sea they will live through. Three men constitute the crew, who pull a very short chopping stroke, at times, when cutting an eddy or string of tide, reaching nearly forty-five a minute. In the last century, similar boats seem to have been in use all over Shetland, but at the present day they are confined to Fair Isle.

COMMISSIONERS OF SUPPLY FOR ORKNEY (THE).

Model of a Westray Yawl.

Scale, one inch to the foot. Timber, oak and white Norwegian pine. Fastened, galvanised iron. Length, on keel, 14 ft.; length over all, 19 ft.; depth at stem-head, 4 ft. 7½ in.; depth at lowest point of gunwale, 3 ft. 6½ in.; depth at stern-post, 4 ft. 4½ in.; oars (two pair), one pair, 14 ft., the other 12 ft.; masts (two), each, 16 ft.; foremast, stepped from stem, 2 ft. 4 in.; mainmast, stepped from stem, 9 ft.; sails.

Cost equipped for sea £15.

The Norse type of boat is confined in the Orkneys to the North Isles, where they are occasionally smack-rigged. In the Southern Isles the boats are generally built on similar lines to the ordinary Scotch and English type of small boat, and as a rule are sprit-rigged.

TUDOR, JOHN R., St. Leonards-on-Sea.

Model of a Färoese "Eight-man-boat," fully equipped for the grind or chase of the grind whale (*Delphinus deductor*) of Scoresby, and the Ca'in whale of Shetland and the Orkneys.

Scale, one inch to the foot. Length on keel, 16 ft. 6 in.; length over all, 28 ft.; beam extreme, 6 ft. 6 in.; depth at stem-head, 6 ft.; depth at lowest point of gunwale, 3 ft.; depth at stern-post, 5 ft. 6 in.; foremast, 15 ft. 9 in.; foreyard, 10 ft.; mainmast, 13 ft. 6 in.; mainyard, 6 ft.; oars, eight in number, pulled double bauked, each 11 ft. 9 in.

The foremast can be stepped either at the forethwart or at the second thwart. The former is said to be the more

NDERSON, ABBOTT, & ANDERSON'S
FOR ARDEN USE. HAMMOCKS FOR TOURISTS' USE.
7, QUEEN VICTORIA ST., LONDON, E.C.

TUDOR, JOHN R.—*continued.*

usual place, and when thus stepped, the boat, it is said, will look pretty nearly dead in the wind's eye.

The whaling implements consist of—

1. 2 Lances.
2. 2 Hooks and Lines for towing the whales when dead.
3. A kind of slung shot attached to a long line and used (1) for anchoring or deadening the boat's way; (2) as a missile for driving the whales into shallow water.

The Shetland Sixern, the Fair Isle Skiff, the Westray Yawl, and the Färoese boat models are all exhibited together, and near Lady Brassey's model of the Gokstad Viking Ship, in order to show the descent of the fishing boats of the present day belonging to the islands of the western *haaf* from the *langs-kibet* of Viking times. And it will be noticed that all four models have in common with that of the Gokstad one of the following characteristics:—

Fine entrance forward.
A flat or comparatively flat mid-ship section.
A fine run aft.
Rake more or less of stem and stern-post.
Sheer more or less of gunwale.

BARNETT, JAMES, Kirkwall, Orkney.

Hand Line for Inshore.
Hand Line for Deep Sea.
Small Line for Bays.
Long Line for Deep Sea.
"Murderer."
Saithe Line.
Pollack Line.
Pock Net for Sillocks.
Dog Fish Net.
Sillock or Cuithe Rods.
Cuithe Rod and Hair Line.
Harpoon and Lance, for Bottle-nosed Whale.
Seal Net.
Oyster Dredge.
Mussel Dredge.
Oyster Tongs and Glass.
Lobster Creel.

ANDERSON, ABBOTT, & ANDERSON,
SOLE MANUFACTURERS OF THE CELEBRATED
LEVE ANTIPLUVIUM WATERPROOF GARMENTS,
SUITED FOR ALL CLIMATES
For Gent's Fishing Waterproof Coats and Leggings, being the lightest fabric manufactured in the World.

ETT, JAMES—*continued.*
Lobster Ring.
Buckie Creel.
Model of Fishing Boat, not under 45 ft. keel.
Model of Drifter for Herring Fisheries.

**W, THOMAS JOHN,** Wells-next-the-Sea, Norfolk.
The "Catamaran," Uncapsizable Life Raft.

**LL, W. H.**
Inventions for preventing the capsizing of boats.

**OFTON, COMMANDER THE HONOURABLE F. G.,** N., Harbour House, Kingstown, Ireland.
Skeleton model of boat hung from stand to show mode of disengaging boat's tackles instantaneously at will.

**CHLER, S. F.,** 162 Great Portland Street, London, W.
Machine for Atmospheric Pressure.
One Siren Life-saving Apparatus is put afloat in water in connection with the hose, whereby it is controlled and kept from being lost. Compressed air constitutes the propelling force supplied from land and effectually floats the whole length of hose. The latter is inflated with compressed atmosphere, also acting on the Siren, and produces continuous sound. The Siren in this case acts threefold, 1st, constant sound; 2nd, exhaust through the mask, the escape prevents the water from entering, causes motion propulsion; 3rd, mechanical rotation to screw propellor. The hose is affected fourfold: 1st, the hose a controller; 2nd, conductor for compressed air; 3rd, transmission of sound; 4th, continuous life-buoy.

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## DIVISION X.

**Appliances and methods for breaking the force of the at the entrance of harbours and elsewhere.**

*** *In Life Boat Gallery.*

**RDON, JOHN, JUN.,** Maryfield, Dundee.
Shells of Iron containing oil made so as to burst on reaching Water.
Cannon or Mortar for firing same.


**ORTSMEN, TOURISTS, & OTHERS**
Are invited to inspect the
**CK OF INDIA-RUBBER & WATERPROOF ARTICLES**
Of every description at
**NDERSON, ABBOTT, & ANDERSON'S**
before purchasing elsewhere.

411. **LEEDS, LEWIS W.**, 38 Old Jewry, London, E.C.
Lighthouse System of Signalling at night from fishing fleets and vessels.

412. **TEASDEL, WILLIAM**, C.E., Harbour Works, Great Yarmouth, Norfolk.
Drawing of Wave Screen, or Breakwater, for breaking the force of the sea at entrance of bar harbours or elsewhere.

413. **GILLINGS, JAMES**, 19 Havelock Road, Great Yarmouth.
A Collection of Appliances for breaking the force of the Sea, to be carried on board of Vessels, and can also be used as life buoys.
Rocket Apparatus for firing Oil Tubes, &c.
Sets of Frictionless Brass Brushes.
2 Wheels.
One Axle.

413*a*. **BOWMAN, JAMES**, 22 Square, Huntly, Aberdeenshire, N.B.
Apparatus for spreading oil for breaking the force of the sea-waves. May be used at the entrance to harbours, on board fishing boats and the largest sailing vessels.

413*b*. **ROSE, R., & CO.**, 72 Leadenhall Street, London, E.C.
Method of Breaking Force of Sea, &c., to be shown in competition for special prizes.
Small Patent Apparatus for discharging oil; for use in ship's boats and lifeboats.
Ditto, larger size, for sailing vessels.
Ditto, for steam ships.

413*c*. **WILKINS, FREDERIC**, 55 Poland Street, London, W.
A Floating Breakwater, Harbour of Refuge, and Landing Stage. These have the buoyancy of ordinary ships, but have no freeboard at the bows, so that sand and waves break over them without injurious effect. Suitable for the Goodwin Sands, or any coast.

LADIES'
LEVE ANTIPLUVIUM CAPES.
*For the Pocket. Only 10 oz. in weight.*
*Anderson, Abbott, & Anderson, Makers.*

## Division XI.

**Methods of communication from the shore to lightships and fishing fleets by submarine cables; telephones or other means of signalling.**

14. **BAPTY, S. S.**, 7 Royal Circus Street, Greenwich.
Mode of communication with Lightships and Fishing Fleets.

14a. **TELEGRAPH CONSTRUCTION AND MAINTENANCE COMPANY**, 38 Old Broad Street, London.
Model of Apparatus for connecting Lightships with the Shore.

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## Division XII.

**Methods of protecting submarine cables from injury by fishing operations (illustrated by models and drawings).**

15. **SCHREIBER, CARL G. VON**, St. Margaret's College, Lowestoft.
Protection for Submarine Cables from injury by fishing operations, &c.

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## Freshwater Fishing.

The origin of the art of angling is lost in the mist of ages. There is ample testimony to show that even fly-fishing with an imitation of the natural fly was practised more than 2000 years ago. Ælian mentions the fact, and accurately describes the trout in the river Astreus taking a natural fly called Hippurus, and, how the natives of Macedonia constructed an imitation with a body of purple wool and with "wings of a waxy colour," which they dropped down the stream and which was seized by the fish. But the art of angling was far older than this, as the carvings on ancient Egyptian monuments amply testify. The Chinese and Japanese have been anglers for ages. The artificial flies of the Japanese would attract the curious attention of British anglers in the present day. The first author of whom we have any note in this country, who described "the art of Fyshynge with an Angle," was Dame Juliana Berners, Prioress of Sopwell nunnery in Hertfordshire, who wrote and published the Book of St. Albans in 1486. The first edition, printed by the schoolmaster printer of St. Albans, did not contain the treatise on angling, but the second, "Enprynted at Westmestre by Wynkyn the Worde in the yere of thyncarnacōn of our lorde mcccclxxxxvi" contained the treatise on fishing. Angling in those days was by no means so common a practice as it is now, as may be gathered from the reason given by the worthy prioress for including this pamphlet in the much larger publication, as she puts it, "bycause that this preseant treatyse sholde not come to the handys of ochē ydle persone whyche wolde desire it yf it were enprynted allone by itself and put in a lytyle plaunflett, therefore I have compylyd it in a greter volume of dyverse bokys concernynge to gentyll and noble men to the entent that the forsayd ydle persones whyche sholde have but lytyle mesure in the sayd dysporte of fysshing sholde not by this meane utterly dystroye it." Probably for this

reason the number of authors who followed Dame Juliana for the next 200 years or so were very limited. In 1653 Isaak Walton wrote his delightful pastoral, which even at the present day is devoured with pleasure not only by anglers but by all lovers of country life and scenes. For another 200 years or so the number of works on angling came out but slowly, though far more rapidly than in the previous time. In 1811 one of the best known lists of angling works was published by G. W. H. Ellis; it numbered 80 works. Since then, however, the increase has been most rapid, and during the last 15 or 20 years work after work has poured out of the press until in the present year of 1883 we read in the new edition of the Bibliotheca Piscatoria, published by Messrs. Westwood and Satchell lately, that no less than 3158 editions and reprints of 2148 distinct works are given and described in their catalogue. Tackle in the far-off times was of the rudest, a taper reed for a rod, some twisted horsehairs for a line, and a hook more remarkable for power than finish, which is not surprising when we find that amateur hook-making was generally practised in those days. And even in books not much more than 100 years old, minute directions were given as to the manufacture of hooks. But the increase of the literature is symptomatic of the increase in the practice of angling, and if the noble and gentle Dame Juliana could only come out of Sopwell Priory to the not far distant banks of the Lea and see the class of people who throng its banks on any and every holiday to indulge in the gentle "dysporte of fysshynge with an angle," she would indeed be filled with amazement. For the sport of angling is now not only the sport of the select few, but of the many; it is a beneficent, health-giving pursuit, good both for the body and mind of the toiling thousands or even millions who throng the back streets of our larger cities, and who have no other inducement to leave their unhealthy habitations for the fresh air of the country. From this point of view (and it is a national point) the art of angling is a powerful lever for good if properly worked and exercised. Fifty years ago the London angler was derided as the Cockney fisherman, and jokes innumerable were cut upon his skill, his rod and his tackle; all this is changed, the fishermen and the tackle now sent forth from the great Metropolis are alike of the first excellence. Yearly, at the annual holiday, mighty fishers—peers, members of Parliament, professional men, hard worked men of business, rush off to Norway or Canada, the Highlands of Scotland, Wales, and Ireland, and by the banks of murmuring stream or thundering torrent recuperate brain, muscle and nerve power, in the absorbing pursuit after trout or salmon, returning after a six weeks' interregnum renewed and invigorated, and prepared to encounter anew the toil and exigencies of modern life and labours. That all the items required for the practice of their art should be constantly improved upon and brought to the most excellent and handy make and fashion, is a matter of course. Rods, reels and lines, though admirable enough to meet all requirements in days gone by, are undoubtedly both better made and better suited to modern needs now, if the same amount of care is bestowed on their manufacture which was wont to be given to them formerly. That much inferior tackle is also turned out, owing to the mania for cheapness, is undoubted. Manufacturers to meet this desire set up all sorts of clever time-and labour-saving machinery, and turn out rods by the score where they could only turn out units by hand. But the careful inspection and the thorough test so requisite in the case of a really good article, cannot be and is not given; and though it is quite probable that by accident you may get a fairly good thing cheaply, it is equally so that you may find your purchase dear at any price. If an angler desires tackle which he can trust in, he should go to the best makers and pay the best price for it. Nets and other apparatus for fishing

for salmon and other fish in fresh water have been so improved that the only fear is that they may become too perfect for the prosperity of the fisheries; while the improvements in waterproof clothing, boats, and all other fishing requisites can better be seen than described. All countries have contributed to send us the best they can produce in all these matters, and the choice we now have is truly vast and varied.

FRANCIS FRANCIS,
*Angling Editor of the "Field," and late Naturalist Director of the Brighton Aquarium.*

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## FRESHWATER FISHING.

*** *In Central Inland Fisheries Gallery, running East and West.*

### DIVISION XIII.

**Salmon nets and fixed appliances for catching Salmonidæ in all their varieties.**

### DIVISION XIV.

**Salmon rods, reels, lines, artificial flies and baits, gaffs, spears, creels, &c.**

### DIVISION XV.

**Trout rods, reels, landing nets, lines, artificial flies, baits, baskets, bags, &c.**

### DIVISION XVI.

**Pike, barbel, and other coarse-fish rods, reels and tackle, artificial spinning baits, &c.**

### DIVISION XVII.

**Traps, nets, bucks, wheels, and all kinds of apparatus for catching eels, lampreys, &c.**

### DIVISION XVIII.

**Hooks, &c.**

16. **DAVIDSON, GEORGE & WILLIAM,** 18 Regent Quay, Aberdeen.
Model Salmon Bag Net, Fly Net and River Net.

**ANDERSON, ABBOTT, & ANDERSON'S**
**FISHING STOCKINGS**
**ARE GUARANTEED ABSOLUTELY WATERPROOF.**
**37, Queen Victoria Street, London, E.C.**

417. **JONES, CAPTAIN A. J.**, 2 Sandown Terrace, Chester.
Coracle Net.
Coracle Net.
Trammel Net.

418. **TOUGH, GEORGE**, Salmon Fishings, Portmahomack, Ross-shire.
Miscellaneous: 62 Salmon Nets.

419. **BERWICK SALMON FISHERIES COMPANY, Limited**, Berwick on Tweed.
Model of Salmon Fishing Coble and Weir Shot Net as used on the River Tweed.

420. **PARKER, WILLIAM**, Chairman of the Board of Conservators of the Eden Fishery District, Carlton Hill, Penrith.
Plan of a Stake Net for Salmon, on a scale of 50 feet to an inch.
Detailed Model of one of the largest traps, on a scale of 4 feet to an inch.

421. **FOYLE AND BANN FISHERIES**, Fishery Office, Londonderry, Ireland.
Stake Net for capture of Salmon in Lough Foyle, Londonderry.
Cruives for capture of Salmon at the Salmon Leap, Coleraine, on the River Bann. The property of the Hon. the Irish Society of London.

422. **FISHERIES PRESERVATION ASSOCIATION**, per H. A. Kinloch, Secretary, 11 Seymour Street, Portman Square.
Models of Salmon Nets.
Models of Weirs with fish-passes.
Models of Putchers, &c.

423. **McCREADIE, G.**, Fort House, Ayr, N.B.
Small Bag Net.

424. **DICKSON, THOMAS**, Fisherman, Northgate, Annan, N.B.
Haaf Net used in Solway.
Poke Nets used in Solway.

425. **WOODFIELD, WILLIAM, & SONS**, Easemore Works and Victoria Mills, Redditch, Worcestershire.
Salmon, Trout, and Coarse Fish Rods, Reels, Lines, Artificial Flies and Baits, Gaffs, Spears, Creels, &c.
Freshwater Fish Hooks.

**W. BARTLEET AND SONS,**
REDDITCH.
TESTED FISH HOOKS & FISHING TACKLE.
e Exhibit Case (*not for competition*) removed from
: BUCKLAND'S FISHERY MUSEUM.
nt page ii.) 1' AND PRIZE MEDALS.

**CUMMINS, WILLIAM JOHN,** Bishop Auckland.
Salmon Rods, assorted sizes and qualities.
An assortment of Salmon Reels.
The "Canadian" Salmon Lines.
An assortment of Flies and Baits.
An assortment of Gaffs.
Salmon Bags.
Salmon Fly Books.
Salmon and Trout Hooks.

**ALFRED & SON,** 20 Moorgate Street, London, E.C.
Salmon Rods, of Split Cane, Greenheart, Hickory, &c.

Salmon Reels, Alfred's Pattern, &c.
Salmon Lines, prepared silk and plaited silk and hair.

Salmon Casts, plaited gut, double gut, and extra stout single gut.
Salmon Flies, special collection.
Salmon Baits, artificial fish, phantoms, Bell's Life spinners, &c.

Gaffs, Landing Nets, &c.
Trout Rods, Reels, Lines, Trout Flies on Hall's eyed-hooks, &c.

Bell's Life Spinners and other Artificial Baits.
Folding Landing Rings, &c.
Pike, Barbel, and other Rods, &c.
Eel Traps.
Hooks.

**LITTLE, G., & CO.,** 15 Fetter Lane, London, E.C.
Salmon Rods.
Salmon Winches and improved Ebonite protected edge Winches.
Lines, Fly Books, and Dubbing Books.
Flies.
Baits.
Landing Rings, Gaffs, Nets, &c.
Split Cane Rods.
Patent Soleskin Phantoms.
Trout Rods.
Split Cane Rods.

G. LITTLE AND CO.,
FISHING ROD & TACKLE MAKERS.
PRIZE MEDALS, 1851, the only award out of 25 Exhibitors.
15, FETTER LANE, LONDON, E.C.

417. **JONES, CAPTAIN A. J.**, 2 Sandown Terrace, Chester.
Coracle Net.
Coracle Net.
Trammel Net.

418. **TOUGH, GEORGE**, Salmon Fishings, Portmahomack, Ross-shire.
Miscellaneous: 62 Salmon Nets.

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Salmon, Trout, and Coarse Fish Rods, Reels, Lines, Artificial Flies and Baits, Gaffs, Spears, Creels, &c.
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FRANK BUCKLAND'S FISHERY MUSEUM.
(See Advertisement page ii.) 11 GOLD AND PRIZE MEDALS.

**UMMINS, WILLIAM JOHN,** Bishop Auckland.
Salmon Rods, assorted sizes and qualities.
An assortment of Salmon Reels.
The "Canadian" Salmon Lines.
An assortment of Flies and Baits.
An assortment of Gaffs.
Salmon Bags.
Salmon Fly Books.
Salmon and Trout Hooks.

**ALFRED & SON,** 20 Moorgate Street, London, E.C.
Salmon Rods, of Split Cane, Greenheart, Hickory, &c.

Salmon Reels, Alfred's Pattern, &c.
Salmon Lines, prepared silk and plaited silk and hair.

Salmon Casts, plaited gut, double gut, and extra stout single gut.
Salmon Flies, special collection.
Salmon Baits, artificial fish, phantoms, Bell's Life spinners, &c.

Gaffs, Landing Nets, &c.
Trout Rods, Reels, Lines, Trout Flies on Hall's eyed-hooks, &c.

Bell's Life Spinners and other Artificial Baits.
Folding Landing Rings, &c.
Pike, Barbel, and other Rods, &c.
Eel Traps.
Hooks.

**LITTLE, G., & CO.,** 15 Fetter Lane, London, E.C.
Salmon Rods.
Salmon Winches and improved Ebonite protected edge Winches.
Lines, Fly Books, and Dubbing Books.
Flies.
Baits.
Landing Rings, Gaffs, Nets, &c.
Split Cane Rods.
Patent Soleskin Phantoms.
Trout Rods.
Split Cane Rods.

G. LITTLE AND CO.,
FISHING ROD & TACKLE MAKERS.
PRIZE MEDALS, 1851, the only award out of 25 Exhibitors.
15, FETTER LANE, LONDON, E.C.

**LITTLE, G., & CO.**—*continued.*
Winches, Lines, Flies, Patent Soleskin Phantoms, and Artificial Baits.
Unique Fly Book, and Fly Books.
New Winch Fittings.
Pike Rods, Bottom Rods, General Rods, New Winch Fittings, Winches, Lines, Artificial Baits, and all necessary Tackle and Traces.

429. **FARLOW, CHARLES, & CO.**, 191 Strand, London, W.C.
Salmon Rods, Reels, Lines, Artificial Flies and Baits, Gaffs, Spears, Creels, &c.
Salmon Nets and Fixed Appliances for catching Salmonidæ in all their Varieties.
Trout Rods, Reels, Landing Nets, Lines, Artificial Flies, Baits, Baskets, Bags, &c.
Trolling, Spinning, and Bottom Rods.
Pike, Barbel, and other Coarse Fish Rods, Reels and Tackle, Artificial Spinning Baits, &c.
Traps, Nets, Bucks, Wheels, and all kinds of apparatus for catching Eels, Lampreys, &c.
Hooks, &c. Swivels and Collapsing Rings, &c.

430. **MILWARD, HENRY, & SONS**, Washford Mills, Redditch.
Artificial Trout Flies.
Sea, Lake and River Fish Hooks of every description.
Processes in the manufacture of Fish Hooks in operation.

431. **PRICKMAN, E. F.**, 12 North Street, Exeter.
Artificial Bait and Flies.
The original "Angel Tolnes" Minnow.
Artificial Flies made from natural colour feathers and materials.

432. **FORREST & SONS**, 35 Square, Kelso, N.B.
Salmon Rods, Reels, Lines, Casts, Artificial Flies and Baits, Creels, Fish-bags, Landing Nets, Gaffs.
Trout Rods, Reels, Lines, Casts, Artificial Flies and Baits, Baskets and Bags.

433. **WRIGHT, JAMES**, Sprouston, near Kelso, Roxburghshire, Scotland.
Salmon Flies.

ANDERSON, ABBOTT, & ANDERSON'S
PATENT TANNED CANVAS RUBBER-LINED FIRE HOSE.
*SUPPLIED TO ALL PARTS OF THE WORLD.*
Guaranteed Pressure, 300-lbs. to the square inch.
37, QUEEN VICTORIA STREET,
LONDON, ENGLAND.
*Prices, Samples, and Opinions of the Press on application.*

**WRIGHT, JAMES**—*continued.*
Salmon Casting Lines.
Sea Trout Flies.
Loch Flies.
River Trout Flies.
Trout Casting Lines.

4. **SMITH, OGDEN,** 4 Stanley Terrace, St. John's Hill, Clapham Junction.
Collection of Salmon, Trout, and other Rods, Artificial Flies, Baits, &c.

5. **RAMSBOTTOM, R.,** 81 Market Street, Manchester.
Salmon Rods, Reels, Lines, Flies, Baits, Gaffs, Creels, &c.
Trout Rods, Reels, &c., &c.
Pike Rods and Tackle, &c.
Hooks, &c.

6. **TOPPIN, PERCY,** Glan-yr-Afon, Strawberry Hill.
A few Artificial Salmon Flies made by Exhibitor, chiefly suitable for the Welsh Rivers.

7. **BERNEY, GEORGE DUCKETT,** Morton Hall, Norwich.
Landing Net and Salmon Gaff.
Trout Landing Net.
Model of Improved Eel Spear with part of handle cut off.
Model of Improved Eel Spear, without its handle.

8. **MANCHESTER COTTON TWINE-SPINNING COMPANY,** Director, John Wilcock, 51, Corporation Street, Manchester.
Fishing Nets, Lines, &c.

9. **ROBERTS, SAMUEL,** Fishing Tackle Maker, Llangollen, N. Wales.
Collection of Salmon and Trout Flies for River Dee (Chester).

10. **FOSTER, D. & W. H.,** Ashbourne, Derbyshire.
Trout Fly Rods; do. Reels (new and protected articles); also Fly Lines, Trout and Grayling Flies, Lake ditto, and Fly Books (new designs); also specialities in Gut Casts, Sea Trout Rods, &c.

**ANDERSON, ABBOTT, & ANDERSON,**
**Makers of the Waterproof**
NAVY REGULATION COAT AND CAPE.
37 QUEEN VICTORIA ST., LONDON, E.C. WORKS—LIMEHOUSE, E.

441. **WARNER, J., & SONS**, Hewell Works, Redditch.
Salmon Rods, Reels. Lines, Flies, Baits, &c.
Trout Rods, Reels, Lines, Flies, Baits, &c.
Rods, Lines, Floats, Reels, Baits, &c., for coarse fishing.
Warner's Patent Needle-Eyed and other Hooks.

442. **KELSON, G. M.**
Flies and Fishing Appliances.

443. **HARDY BROTHERS**, Feukle Street, Alnwick, Northumberland.
Salmon Rods in built cane and wood, fitted with Hardy's Patent Lockfast Spiral Joint, and Winch Fitting, cork and other handles, with new rings which cannot wear the silk lapping. Salmon Tackle. Books, Reels, Lines, Flies, Tackle, &c.
Trout Rods in built cane and wood, fitted with Hardy's Patent Lockfast Spiral Joints and Winch Fitting Cork and other Handles, from 8 ounces in weight, new pattern Triangular Landing Nets, new pattern Creel to contain the Tackle Hook, Sandwich case, Reel and Fish, with knapsack arrangement of straps; New Spinning Minnow Tackle, Alnwick Spinner Reels, Books, Flies, Tackle, &c.

444. **TRICKETT, JOHN**, 16 Bennett Street, High Fields, Sheffield.
Salmon Spears.
Knives for Scaling.

445. **EATON & DELLER**, 6 and 7 Crooked Lane, London Bridge, London, E.C.
Six-piece split cane and other Salmon Rods.
Salmon Winches.
Salmon Flies.
Salmon Gut.
Six-piece split cane and other Trout Rods.
Trout Winches.
Trout Flies.
Trout Gut.

446. **MILNE, WILLIAM**, Practical Fly Dresser and Fishing Tackle Manufacturer, 32 Back Wynd, Union Street, Aberdeen.
Samples of Salmon Flies used in general for Salmon Fishing.
Samples of Trout Flies used for Lake, River and Brook Fishing.

*As worn by Royalty and other Members of the Royal Yacht Club.*
(Copy of Testimonial.) HOME OFFICE, *September 3rd*, 1878.
MESSRS. ANDERSON & CO., You made me an Oilskin Coat about seven years ago, which has lasted in capital condition until this year.
(Signed)
A. F. O. LIDDELL.
THE ROYAL YACHTING COAT.
SOLE MAKERS,
37, QUEEN VICTORIA STREET, E.C.
ANDERSON, ABBOTT, & ANDERSON.

**ANDREWS, THOMAS LEO,** High Street, Uppingham.

One case of Salmon Rods. A collection of glued-up rods, of varying strength and descriptions of cane.

A collection of Glued-up Trout Rods of varying strength and descriptions of cane.

**WILLIAMS, F. T., & CO.,** 10 Great Queen Street, London, W.C.

American Split Cane, Greenheart, Washaba, and Hickory Salmon Rods, improved Ebonite, bound Winches, general collection of Salmon Flies, for England, Ireland, Scotland, Wales, Canada, Norway, and India; Phantoms, Exeters, the new "Boycott" Bait, and our improved rigid tail "Clipper" Bait, and various other Baits for Salmon; Baskets, Gaffs, Handles, and Casts.

Exhibitors' make of Split Cane, Greenheart, and Hickory Trout Rods, new portable Rods, Ebonite, Bronzed, Brass, and Brass Check Winches, Collapsing nickel plated Steel and Whalebone Rings, Nets, Handles, general collection of Artificial Flies and Spinning Baits, Traces, Casts, plaited Silk and Hair Lines, prepared Silk Lines, our new pattern Fly Book.

Pike, Roach, Barbel Rods of every description, for punt or bank; mounted Hooks, Lines, Floats, Shots, Reels, dressed and undressed; Silk Lines of every description; Jack Tackle of every description; Japanned Boxes; every description of Tackle for bottom and jack fishing. Improved Rigid Tail "Clipper" Bait for Pike and Perch, Dace, Spoons and various other Baits.

Wicker and Wire Eel Traps.

Gudgeon and Minnow Cast Nets.

New pattern Crystal Roach Hooks, nickel plated Bright and blue, and various other pattern Hooks; also double and treble Hooks of various descriptions.

**BERNARD, J., & SON,** 5 Church Place, Piccadilly, London, S.W.

Salmon Rods, Reels, Lines, Artificial Flies, Baits, Gaffs.

Trout Rods, Reels, Landing Nets, Lines, Artificial Flies, Baits, &c.

Pike, Barbel, and other coarse Fish Rods, Reels, Tackles, Baits, &c.

J. BERNARD & SON,
5 CHURCH PLACE, PICCADILLY, S.W.
MANUFACTURERS OF
FIRST QUALITY FISHING RODS & TACKLE,
SUITABLE FOR ALL PARTS OF THE WORLD.
PRIZE MEDAL, 1862.

450. **ROYSTON, ROBERT RICHARD,** 10 King Street, Caml
Sample of Waterproofing, "with line that has been
3 years," and to be shown in a small flat glass case.

451. **FIELD, BASIL,** 36 Lincoln's Inn Fields, London.
Telescopic-handled Gaff Hook, with a Guard, folding u
matically when handle is elongated, and re-adjusting
when handle is closed.
Bait Can, with Bellows in Handle, for aërating water.
Fly Rod, with novel appliance for fastening the splic
splice protecting caps or covers.

452. **OGDEN & SCOTFORD,** 7 Portland Terrace, Pi
Cheltenham.
Fishing Rods and Artificial Flies.

453. **ROGAN, MICHAEL,** Ballyshannon, Co. Donegal.
Salmon Rod and Salmon Flies.
Trout Rod, Double-handed Lake Trout Rod, and Trout

454. **KINNAIR, W. K.,** 63 North Bridge, Edinburgh, N.B.
Salmon Fly Books.
Salmon Fly Dressing Material Books.
Salmon Fly Stock Books.
Trout Fly Books.
Trout Fly Dressing Material Books.
Trout and Loch Fly Stock Books.
Trout Bait and Tackle Books.

455. **ANDERSON, R., AND SON,** N.B.
Freshwater Fishing Appliances.

456. **CARTER, A., & SONS,** 137 St. John Street Road, E.C.
Salmon and Trout Fishing Rods, Flies, Tackle, &c.
A Collection of other Fishing Rods, Flies, and Tackle.

457. **BOLSTER, JOHN & SONS,** Lower Bridge Street, M
Ireland.
General Collection of Salmon Flies for Ireland.
Collection of Materials for Dressing Salmon Flies.
Collection of materials for Dressing Trout Flies.

BUY YOUR WADERS FROM THE MAKE
**ANDERSON, ABBOTT, & ANDERS**
*37, Queen Victoria St., London, E.*

**DRED, THOMAS,** 258 Oxford Street, London.
Three-piece Glued up Triangular Cane, and other descriptions of Salmon Rods, Reels, Lines, and Tackle.
Three piece glued up Triangular cane, and other descriptions of Trout Rods, Reels, Lines, and Tackle for Trout.
Pike, Barbel, and other Coarse Fish-Rods, Reels and Tackle, Artificial Spinning Baits, &c.

**OUNG, R.,** 1 Bredon Place, Besley Road, Redditch.
Collection of Fishing Books to contain Trout Flies, &c.; also Fishing Tackle Cases to hold Fishing Tackle, &c.

**O'FEE, DANIEL,** Rasharkin, Co. Antrim, Ireland.
General Collection of Salmon Flies for Irish and Scotch rivers.
A Collection of Salmon Flies for a few of the Irish Rivers.
A Collection of Sea Trout Flies for the Irish Rivers.
Some dyed Wools and Feathers.

**COCHRANE, WILLIAM,** 4 Grove Place, Edinburgh.
Salmon Rods, Reels, &c.
Trout Rods, Reels, &c.

**RYDER, W. H.,** 33 to 36 Slaney Street, Birmingham.
Salmon Rod and Reel attached, upon new principle.
New Trout Rod and Reel combined, having an equal balance in hand in any position. It is extremely easy to attach or detach from rod, yet equally secure.
Cast stamped and other Artificial Bait; simple fastenings for constructing cheap Rings for Landing Nets.

**SLATER, D.,** 9 and 10 Portland Street, Newark-on-Trent.
Collection of Salmon Rods, Lines, Artificial Flies, and Gut Casts.
Collection of Salmon Reels in Ebonite, Brass and Wood.
Collection of Trout Rods.
Collection of Trout Reels in Ebonite, Brass, and Wood.
Collection of Trout Lines, single and double taper.
Landing Nets.
Collection of Artificial Flies.
Collection of Trout Rods, Lines, Artificial Flies, and Gut Casts.

**G. LITTLE & Co.,**
**ISHING-ROD AND TACKLE MAKERS.**
**PATENT SOLESKIN PHANTOMS,**
**he most successful Bait ever invented.**
**15, FETTER LANE, LONDON, E.C.**

**SLATER, D.**—*continued.*

Collection of Artificial Baits.
Collection of Pike, Barbel, and other coarse Fish Rods; also Nottingham style.
Collection of Wood Reels, Centre Pin Reels, with and without check action.
Collection of Bottom Tackle, Floats, and Lines.
Collection of Nottingham Floats and Lines.
Collection of general Rods.

464. **WATSON, W., & SONS,** 308 and 313 High Holborn, London, W.C.

A Collection of Spliced Cane Salmon Rods, and other Salmon Rods of ordinary pattern but superior manufacture and finish.
A Collection of artificial Flies for Salmon Fishing.
A Collection of various pattern Salmon Reels.
Salmon Lines, Gaff Hooks, Creels.
A Collection of spliced Cane Trout Rods, and Trout Rods of ordinary pattern, but superior manufacture and finish.
A Collection of Reels, Lines, Flies, Bait, &c., for Trout fishing.
A Collection of Spinning and Trolling Rods, Spinning Bait, Reels, and Tackle.
A Collection of Hooks for Fishing, comprising all the sizes and patterns in ordinary use.

465. **WRIGHT, ROBERT,** 16 Princes Street, Edinburgh.

Collection of Fishing Rods (Salmon).
Gut Casts, also Salmon Reels, having a new design for fastening to rods.
Salmon Rods with new screw joints.
Collection of Salmon Books and Fly Boxes.
A new and improved durable Gut Salmon coasting line.
Collection of Salmon Flies.
Fishing Reel Lines.
Collection of Trout Rods with New Screw Joints.
Gut Casts.
Collection of Sea Trout, Loch and River Trout Flies.
Fishing Reels with new principle for fastening on to the rod.
Double and Treble Hooked Flies for Loch and River Fishing.
Fly Books and Fly Boxes and Fly Dressing Materials.

*ANDERSON, ABBOTT, & ANDERSON'S*
**FISHING TROUSERS**
**Are unequalled for Quality, Finish and Wear.**
37, QUEEN VICTORIA ST., LONDON, E.C.

**RIGHT, ROBERT**—*continued.*
Gaff Hooks and Landing Nets.
Collection of natural Bait and Worm Hooks.
Fishing Baskets and Bags.

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Salmon Rods, Reels, Lines, Artificial Flies, Baits, Gaffs, Spears, Creels.
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**OLROYD, E. A.,** 59 Gracechurch Street, London.
Salmon Rods, including a rod made expressly for use in India and the Colonies, adapted to Salmon, Mahsen, and general fishing. Salmon Reels, Lines, Artificial Flies, Baits, &c.
Trout Rods, Reels, Landing Nets, Lines, Flies, &c.
In this division is shown the new patent screw fitting for fly and spinning rods.
Coarse Fish Rods, Reels, and Tackle.

**McCARTHY, THOMAS,** William Street, Cashel, co. Tipperary, Ireland.
General Collection of Salmon Flies.
General Collection of Trout Flies.

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Case of Salmon and Trout Flies.

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Fishing Steelyards or Sportsman's Scales of every description, marked to weigh ounces, or from 1 lb. to 50 lbs., manufactured in brass, with index faces, and nickel-plated throughout, preventing rust and inaccuracy.
Specimens of Fly Vices for Fly-making.

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Collection of Salmon Rods, Reels, Lines, Gaffs, Artificial Flies and Baits.
Patent "Sun and Planet" Reel.
Collection of Trout Rods, Reels, Lines, Landing Nets, Artificial Flies, and Baits.

NDERSON, ABBOTT, & ANDERSON'S
Are Unequalled.
WADERS WITH BROGUES ATTACHED.
Are Guaranteed.
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472. **HOVELL, BELFIELD, W.**, Bedford Street, Norwich.
Fishing Baskets, &c.

473. **HORNE, MISS**, Hampton Park, Hereford.
Case of Trout Flies for England.

474. **REDPATH & CO.**, Fishing Rod and Tackle Manufacturers (Wholesale and Export), Tweedside Works, Kelso, N.B.
Collection of Salmon Rods, Reels, Lines, Flies, Baits, Gaffs, Spears, Creels, Bags, &c., &c.
Collection of Trout Rods, Reels, Lines, Flies, Baits, Landing Nets, Baskets, &c.
Collection of Trolling and other Rods, Reels, Lines, and Baits.
Collection of Gut, Gut Lines, Hooks to Gut, Spinning Tackle, &c.

475. **BARTLEET, WILLIAM, & SONS**, Abbey Mills, Redditch; and London. H. Walker, Agent, 53 Gresham Street, E.C.
Upright Case of Fishhooks and Fishing Tackle of all kinds for Sea and Inland fishing. Transferred from the Buckland Museum of Economic Fish Culture.

476. **COOKE, ARTHUR**, 339 Oxford Street, London, W.
Walking-stick Fishing Rods.
Sails, for Sailing on Skates.
Ice Sticks, &c.
Spear Walking Sticks.
Fishing Appliances.

477. **HOLLAND, G.**
Umbrellas (special) for Fishing and other Purposes.

478. **MACNEE, JAMES**, Loch Tummel Side, Pitlochry, Perthshire.
Case containing Salmon and Trout Flies with Pike Scale wings. Salmon Flies, Salmon and Trout Phantoms, Trout and Salmon Casting Lines, and implements to enable the amateur to tie fly wings.
Trout and Salmon Rods.

479. **DREW & SON**, 30 Piccadilly Circus, London, W.
Leather Goods for Fishermen.

480. **FOOTE, HENRY G. B. W.**, Millfort, Mallow, Ireland.
One dozen Artificial Trout Flies.

*"LAND AND WATER" says—*

**"Messrs. BENJAMIN'S Establishment is quite a Tailoring Museum. Sportsmen and Sportswomen in particular can find everything here in the way of Sporting and Outdoor Apparel."**

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**ARE, J. P.**, 40 and 41 Bloomsbury Street, Bedford Square, London, W.C.; and Salmon and Trout Fishery, Llyn Peris, Llanberis, North Wales.
Salmon Rods, Gaffs, &c.
Trout Rods, Gaffs, &c.
Nets for taking Salmon and Trout.

**HAMMOND, JOHN**, College Mill House, Winchester.
Trout Fly Rods, Reels, Lines, Landing Nets, Artificial Flies, Baits, Baskets, and Bags.

**GOLD, JOHN EDWIN**, 284 Waterloo Road, London, S.E.
Fishing Rods made by Exhibitor, comprising Glued up Split Cane Trout Rods in six pieces, Light Roach, Spinning, Trolling and other Rods, Winches and General Tackle.

**HYDE, W. DERBY**, Witney, Oxon.
General Collection of Flies.

**HOWARTH, SAMUEL**, 184 and 185 Station Street, Burton-on-Trent.
Case of Trout Flies, all tied by Exhibitor.

**PRAAG, ALEXANDER VAN, & SON**, 9 Crown Street, Soho, London, W.
Collection of Fishing Rods, Tackle, and Fishing appliances.

**ROBBINS, JOHN**, Latimer Place, Latimer Street, South Birmingham.
Angler's Companion.

**HUNTER, H. L.**, 66 Cressingham Road, Lewisham, S.E.
Scented Baits.

**GREGORY, JAMES**, 39 Vyse Street, Birmingham.
The Gregory Baits (nickel plated).
The Gresham Baits.
The Flexible Cleopatra Baits.
Gregory's Curved Baits.
Fishing Gazette Baits.
The Sportsman Baits.
The Clipper Baits and Spinners.

**ANDERSON, ABBOTT, & ANDERSON'S**
**SHOOTING WATERPROOFS,**
**Ventilated and absolutely Waterproof.**
**37, QUEEN VICTORIA ST., LONDON, E.C.**

**GREGORY, JAMES**—*continued.*
The Windsor Bee Baits.
The Wheeldon Salmon Bait.
Gregory's Spotted Trout Baits.
Gregory's Paragon Baits.
The Norwich, Colorado, Fishing Gazette, double and plain Spoons, in gilt and silver plated.
Burt's Patent Spring Bait.
Gregory's Registered Archimedean Spinners for Dead Bait.
Gregory's Registered Spiral Indestructible Float Caps and Winch Fitting Rings.
The 'Bell's Life' Rod Rings.
Gregory's Artificial Metal Dace.

490. **MARTIN, JOHN WILLIAM,** 4 Northern Buildings, Lovers Lane, Newark-on-Trent.
Collection of Rods, Reels and Lines, Tackle, suitable for the Nottingham style of fishing.
2 Pike Rods, 3 joints.
2 Roach Rods, 3 joints.
2 Chub and Barbel Rods, 3 joints.
1 General Rod, 4 joints.
1 Combination Rod, 6 Joints.
Pike Reel and Line.
Reel, Lines, Floats and Tackle for Bottom Fishing.

491. **EDWARD, JAMES,** Stotfield, Lossiemouth, Morayshire, N.B.
Partan Creel.

492. **GAYNOR & SON,** 10 Royal Terrace, Richmond-on-Thames, Surrey.
Pike, Barbel and other coarse Fish Rods and Tackle, Artificial Spinning Baits, &c.
Eel Wheels or Traps.
Lampern Spurts as used in the Thames Fishery.
Apparatus for Catching Eels.

493. **FARROW, A. J.,** 12 Pulford Street, Pimlico, London, S.W.
Grig Weet.
Lamprey Weet.
Double Engine Trap.
Improved Eel Pot.

**WATERPROOF COATS, ETC.,**
SPECIALLY PREPARED
FOR
INDIA AND THE COLONIES.
MAKERS
37, QUEEN VICTORIA STREET, E.C.
**ANDERSON, ABBOTT, & ANDERSON.**

**FAITHFUL, JAMES,** Houghton, Hants.
Eel pot for Weirs.
Grig Pot.

**ERNE FISHERIES,** Ballyshannon, co. Donegal, Ireland.
Model of Eel Weir with three Eyes and Watch House. Nets shown in Fishing order.
Photograph of Eel Weirs on River Erne.

**WHITEHOUSE, GEORGE,** 30 South Street, Park Road, Liverpool.
A Stake Line to catch Flukes or Eels. This line will have 100 yards of line; 100 hooks; to pay out or lap up in yards.
A prepared Stake Line to Catch Eels. This line will have 50 Limerick Eel Hooks, with 50 yards of line to pay out or lap up.

**FLETCHER, RICHARDSON,** 5 Beresford Place, Dublin.
Samples of Salmon Floats.
Samples of Haake Floats.
Cork wood as the raw material from which the Floats are made.

**BRUNTON, JOHN,** M.A., M.D., 21 Euston Road, London, N.W.
Improved Hooks.
Bayonet Pointed Hooks, specially adapted for penetrating easily.

**DRUKKER & CO., D.,** 7 Fräncis Street, Tottenham Court Road, London, W.C.
Hooks of all kinds.
Collection of Fishing Requisites.

**MARX, M.,** 4 Florence Villa, Woodland Road, Upper Norwood, and Crystal Palace, Sydenham.
Hooks.

**COURT, CHARLES,** Plymouth Works, Redditch.
Sole Inventor and Maker of the Enamelled Brown Rust-Proof Fishing Hooks with Bayonet Points; also the Court Line Bait Hooks for keeping the baits alive without injury of the vital parts of the fish.

**HEMMING & SON, T.,** Windsor Mills, Redditch.
All Kinds of Fish Hooks and Fishing Tackle.

**ANDERSON, ABBOTT, AND ANDERSON'S**
**FISHING HATS AND SOU'-WESTERS**
**ARE THE BEST.**
**37, QUEEN VICTORIA STREET, LONDON, E.C.**

504. **SHEFFIELD MANUFACTURERS' COLLECTION,** per M. Hunter, Junior, Mayor of Sheffield.
Steel used for Fish Hooks.
Various Knives, &c., used by Fishermen.

505. **VALENTINE, GEORGE,** 77 High Street, Perth.
Portable Pocket Case of Fishing Appliances.
Sportsmen's Fishing Knives.
Portable Weighing Balances.
Hook-Dressing Pliers.
Scissors, &c.
Fish Eating Knives, &c.
Net Fishermen's Knives.

505*a*. **KELSON, GEORGE M.,** Colville Mansions, London, W.
Owner's successful Patterns of Salmon Flies which won the Medal and Diploma at Berlin, and the Medal at Norwich. With the two medals in inscribed cases.

505*b*. **MOFFAT, A.,** 80 Balsall Heath Road, Birmingham.
Salmon Rods, Reels.
Lines, Flies.
Baits.
Trout Rods, Reels.
Lines, Flies.
Tripod Magnifiers for examining Artificial Flies, &c.
Pike Lines, &c.

505*c*. **ROBERTSON, WILLIAM,** Fishing Tackle Merchant and Manufacturer, Central Arcade, Hope Street, Glasgow.
Collection of Salmon Rods, Reels, Lines, Gut Casts, Artificial Minnows, Baits, Gaffs, Landing Nets, Bags, &c.
Complete collection of Regular, Refina, Padron, Salmon and Drawn Gut.
Salmon Flies for River and Loch Fishing.
Special Floating Flies for Scotch Loch.
Collection of Gut Casts, Artificial Minnows, Baits, Gaffs, Landing Nets, Bags, &c.
Trout Flies for River and Loch Fishing.
Special Floating Flies for Scotch Lochs.
Complete Collection of Fresh Water Angling Appliances, for Fly and Bottom Fishing.

**CASH'S EMBROIDERED FRILLINGS.**
Price Lists and Descriptive Circulars post free upon application to
**J. & J. CASH, COVENTRY.**

**SKENE & GOODBRAND,** Mounthooly Ropework, Aberdeen.
Samples of Fishing Lines and Salmon Twine as used by the fishermen on the north and west coast of Scotland.

**STEVEN, ROBERT C.,** 15 and 17 West Street, Berwick-upon-Tweed.
Salmon Fishing Rods, Reels, Lines, Flies, Baits, and every description of inland fishing tackle.
Trout Rods, Reels, Lines, Flies, Baits, &c.

**TARRY MILL COMPANY,** per John Muckart, Tarry Mill, by Arbroath, N.B.
Rod Fishing, Collection of Salmon Lines, Collection of Trout Lines.

**BLACKWATER,** Coytrahen, Bridgend, South Wales.
Case of Salmon Flies.

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## DIVISION XIX.

### Anglers' apparel of every description.

06. **CORDING, J. C., & CO.,** 19 Picadilly, London.
Anglers' waterproof apparel of every description.

07. **ANDERSON, ABBOT, & ANDERSON,** 37 Queen Victoria Street, London.
Collection of Anglers' Waterproof Apparel.
Fishing Waterproofs of every description for Anglers, comprising Fishing Boots, Trousers, and Stockings, Fishing Brogues and Bags, Fishing Coats, Jackets, Capes, Hats and Gloves.
The New Buckland Fishing Waders, very light, requiring no separate brogues.
The New Buckland Fishing Jacket. Ventilated, affording absolute protection to the wearer in the roughest weather.

---

**CASH'S EMBROIDERED NAMES,**
FOR MARKING LINEN.
*Any Name can be had in any Type for 6s. 6d. a Gross.*
**J. & J. CASH, COVENTRY,**
And of Hosiers and Drapers everywhere.

**ANDERSON, ABBOT, & ANDERSON**—*continued.*
Fishing Trousers, Stockings and Brogues, various.
The Royal Fishing and Yachting Boots for Ladies, as supplied to the Queen.
Fishing Bags. The Walton, the Freke, the Buckland, the New Expanding Salmon, and other Bags.
The Patent "Leve Antipluvium" Fishing Waterproofs, lightest ever made.
India Rubber Leather-lined Fishing Boots, require no dressing.

508. **EDMISTON & SON,** 14 Cockspur Street, London.
Fishing Outfits in general.
Fishing Coats.
Fishing Boots.
Fishing Bags.
Fishing Hats.
Wading Stockings.
Wading Trousers.
Wading Brogues.
Wading Coats.
Wading Boots.

509. **CORDING, GEORGE,** 125 Regent Street, and 231 Strand, London.
Collection of Fishing Trousers, Stockings, Boots, Brogues, Coats, Bags, &c.

511. **DORE, J. W.,** George Street, Hanover Square, London.
Case containing full size models of Anglers' apparel (Ladies and Gentlemen) complete—with several novelties and recent improvements.

512. **HEATH, HENRY,** 105 and 107 Oxford Street, London, W.
Samples of Anglers' Hatbands, for conveniently carrying artificial flies, hooks, points, &c.
Samples of Hats for Anglers, shown in glass case.
The "Keeps Me Dry" Sou'-Wester, combination in a Sou'-Wester of Hat, Hood, and Cape.
Anglers' Hats for Norway, &c.

G. LITTLE & CO.,
FISHING ROD AND TACKLE MAKERS
To their Royal Highnesses the PRINCE and PRINCESS of WALES.
15, Fetter Lane, London, E.C.

**DOWNING, E.**, Leicester.
Fishermen's Boots.

**BAYLEY, MATTHEW**, Flamborough.
Fishermen's Apparel.

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## Economic Condition of Fishermen.

Whilst the primary object of all International Industrial Exhibitions has ever been the advancement of Art, Industry, and Commerce, they have not the less contributed to exhibit the wonderful resources of human genius, skill, and labour. With the present advanced state of the division of labour, it is difficult, in many cases, to trace the workmanship of any piece of work direct to the labourer himself. Hence the most exquisite specimens of mechanical or hand industry are often only known by the names of the manufacturers or producers who happen to exhibit them. But in a Fishery Exhibition there is not the same difficulty in identifying the part which the labourer has taken in the articles exhibited, and we are thereby brought in direct contact with the fisherman himself.

It may not be easy to give material illustration of the economic condition of fishermen, nevertheless, we shall find it to a large extent reflected in the condition of the industry. If we see any fishery in the main carried on in little boats, owned by the fishermen themselves, in the same manner as the old handlooms in the silk industry, with more hands therein employed than would be required with due regard to economy, with antiquated or insufficient appliances, and using no other power than the wind, evidencing in fact on all sides want of capital and ingenuity, it is easy to conclude that the economic condition of the fishing population is unsatisfactory. If we see any fishery carried on in large and strong boats, worked on a large scale, with the most modern and effective gear and nets, using steam-power and attracting large capital, we may safely gather from it that the economic condition of the fishermen and all connected with the industry is likewise good.

The fishing industry is allied to agriculture in so far as it is directed to gathering the spontaneous products of nature and placing it within reach of consumption and commerce. But it is also a manufacturing industry in all that regards drying, salting, curing, kippering, smoking, &c., and thereby subject to the factory laws. There is a wide difference in the condition of the industry between river fisheries and deep-sea fisheries, such as the herring, the cod, the pilchard, the whale, the oyster, and many others. In all cases, however, the fishing industry is fitful and irregular in times and seasons, and subject to great alternations of pressure, with long intervals of idleness, a circumstance which deeply affects the economic condition of the workers. In some localities the fisherfolk follow the fish; when the fishing is ended in one locality, they proceed to another. In other localities the fisherfolk alternate fishing and agricultural

labour; and in others, when fishing is ended, the fishermen engage as sailors. But in all cases the occupation is of a most intermittent character, inconsistent with persistent labour, and well fitted to encourage lassitude and laziness. The fishing population can scarcely be said to belong to the towns, though affected by many of the conditions of town life. All along the coast-line of the British Isles and other countries, yet centred in fishing ports of greater or less importance, there they live, a hardy, adventurous race, ready, at all hazards, to gather the inexhaustible spoils of the sea.

In several respects the fisherman's lot is worse than that of the agricultural labourer. It was stated in the Report of the Royal Commissioners on Sea Fisheries, that whilst, once in the year, an acre of good land, carefully tilled, produces a ton of corn, or two or three cwts. of meat or cheese, the same area at the bottom of the sea on the best fishing ground may yield a greater weight of food to the persevering fisherman every week in the year. Yet the result to those immediately interested are widely different. There are in the United Kingdom about 120,000 persons constantly, or occasionally, employed in fishing, who with their dependants may be taken at 400,000, and the total annual value of the British fisheries is stated to be over eleven million pounds sterling, giving an average produce of about £27 per head, whilst about 3,300,000 persons employed in agriculture raise annually produce to the extent of about £270,000,000, giving an average of about £82 per head. Accordingly the portion falling to the immediate workers respectively are very different. Whilst of the £11,000,000 produced by the fisheries scarcely thirty per cent., or £3,000,000 go to the pockets of the fishermen, of the £270,000,000, the total produce of land, at least 25 per cent., or about £70,000,000, are spent in wages, giving in the case of the fishermen about £10 per head, exclusive of incomes from other occupations, and in the case of the agriculturist about £21 per head a year, or, taking two earners per family, less than 6*s.* a week for the fisherman, and about 16*s.* a week for the agriculturist. Follow, moreover, a fisherman family and a family of the agricultural labourer in their homes. The fisherman's family have to pay £10 to £12 a year for house rent, the agriculturist £2 to £4 per annum. The agriculturist family has vegetables in abundance always at hand, the fisherman's must purchase everything.

But how is it that the fisherman gets comparatively so little of the produce of his labour? Can any economy be effected in the disposal of the fish? Would not the contract of wages, which would leave the master free to economise the produce, prove more advantageous than the present system? Or would not a contract of partnership between the owners and the fishermen, in the shape of the Commandite principle, answer the purpose better still? What can be done to render the industry more productive and more profitable? Could not steam power be introduced in British fishing vessels as the French have introduced in theirs? Are not the boats used too small in most cases? Are the gear and nets all that can be desired? And what can be done to introduce more safety to life and property? Can the electric telegraph be better utilized for the announcement to fishing vessels already at sea of threatening storms? Is there not great need of larger and more frequent harbours of refuge all along the coasts? Are the boats and gear sufficiently insured, or can any system of mutual insurance be safely introduced? Is life insurance sufficiently appreciated by our fishermen? Exposed to constant danger, do they take advantage of that beneficial system to provide that in case of loss of life their friends and relations shall not be left altogether forlorn. The Post Office Savings Banks are extensively diffused. Do

enter all the nooks and corners of the coast, so as to encourage thrift and eliance among all connected with the fisheries? These are the questions ı determine the economic condition of our fishermen.

e programme of the Great International Fisheries Exhibition divides the ets under this class into—1st. Apparel and Personal Equipment; 2nd. Food Medicine Chest; 3rd. Models and Plans of Dwellings; and 4th. Contracts artnership, Insurance of Life, Boats, Gear; and other branches, however, probably be suggested at the conferences to be held on the economic con- ı of fishermen. A gracious Providence supplements the riches of the earth the riches of the sea for the sustenance of the many millions of the human

And it should be our endeavour, not only to advance as much as possible conditions of the industry, but also to improve the economic condition for ı engaged in the same.

LEONE LEVI,
*Professor of the principles of Commerce and Commercial Law, King's College, London.*

# METROPOLITAN
# Drinking Fountain and Cattle Trough
## ASSOCIATION.

**SUPPORTED ENTIRELY BY VOLUNTARY CONTRIBUTIONS.**

**Offices: Victoria House, 111, Victoria Street, Westminster, S.W.**

*President*—His Grace the Duke of Westminster, K.G. &c. &c.
*Chairman of Committee and Treasurer*—Joseph Fry, Esq.
*General Manager and Secretary*—John Lee, Esq., F.R.G.S.

**THIS IS THE ONLY AGENCY FOR PROVIDING FREE SUPPLIES OF WATER FOR MAN AND BEAST IN THE STREETS OF LONDON,**

and the relief it affords both to human beings and dumb animals is incalculable

The total number of Troughs and Fountains now (March 31st, 1883) erected, and at work in the Metropolis, is as follows: **526 Troughs** for animals, and **511 Fountains** for human beings, at which multitudes of men, women, and children, horses, oxen, sheep, and dogs, quench their thirst daily, amounting in the aggregate to probably not less than the enormous total of **250,000,000** drinkers in a year.

The Committee are urgently in need of and earnestly solict liberal contributions to enable them to sustain and extend this simple scheme for the amelioration of animal suffering and the promotion of habits of temperance amongst our itinerant and working population. Contributions may be paid to the Bankers, Messrs. Ransom, Bouverie, & Co.; Messrs. Barclay, Bevan, & Co.; or to the General Manager and Secretary, at the Office.

To those benevolent individuals who may be inclined to become Benefactors by Will to the Society, the following form is respectfully suggested:

"*I give and bequeath the sum of* *to be paid out of such parts of my personal estate as can be lawfully applied for that purpose unto the Treasurer for the time being of a Society, called or known by the name of THE METROPOLITAN DRINKING FOUNTAIN AND CATTLE TROUGH ASSOCIATION, to be at the disposal of the Committee for the time being of the said Society.*"

Note.—For the information and guidance of persons erecting Memorial or Gift Fountains, either in London or the Country, a number of Models and Designs are on view at the Office; or the General Manager will be happy to give all the advice and information in his power by letter, and to furnish designs and cost of Fountains without charge.

## DIVISION XXI.

### Apparel and personal equipment.

7. **CALLEY & CO.**, 148 Fenchurch Street, E.C.
Samples of "Thésée's" Chemical Oil for the softening, preserving and rendering waterproof all Leather articles, such as Sea Boots, Fishing Lines, Pump and Fire Hose, Leggings, Harness, &c., &c., and samples of articles prepared therewith.

8. **ANDERSON, ABBOTT, & ANDERSON**, 37 Queen Victoria Street, City, London.
Fishermen's Oilskin Apparel and Personal Equipment.
Waterproof Oilskin Clothing for Fishermen of all nations.
The Special "Captain's" Coat.
The "Admiral" Coat, with improved fly.
The "Plimsoll" Jacket.
The Super Leather-bound French Coat, with Epaulets.
Trousers, Leggings and Sou-Westers of every quality to match Coats and Jackets.
Women's Fishing Skirts with Bibs.
Women's Fishing Aprons, as supplied to the Newfoundland Fisheries.
Men's Fishing Vests, with and without sleeves.
Seamen's Bags.
The Royal Yachting Coat, as worn by Royalty.

9. **CHISIM, ANGUS**, 140 & 144 Corporation Street, Belfast. With a Branch in Ardglass, Ireland.
Oilskin Trowsers, made closed up, without fly or fall, for hauling drift nets.
Oilskin Coat, no seam in the body, except the shoulder.
Sou' Wester, with piece round back of the head.
Oilskin Trousers, Jacket and Hood in one. Irish Frieze.
Trousers and Double-breasted Sleeved Vest, made to button close up, or fold down at pleasure.

10. **ROSS, W. R.**, 23 Longate Street, Peterhead, N.B.
Boots to be worn by Fishermen at Sea.

**THE BEST FOOD FOR INFANTS**
IS THE ONLY FOOD EXPRESSLY PREPARED FOR INFANTS.
SUPPLIED TO THE ROYAL NURSERIES.
**SAVORY AND MOORE.**
143, NEW BOND STREET, LONDON.
*AND OF CHEMISTS, &c., EVERYWHERE.*

521. **HENRY, JAMES HAY,** The Pharmacy, Macduff, N.B.
Specimens of Linseed Oil, for use in the preparation of Fishermen's Waterproof Clothing.

522. **FORBES, WILLIAM,** 33 Duff Street, Macduff, N.B.
A Specimen Suit of Clothing as worn by Moray Firth Fishermen.

523. **TIPPITT & SONS,** Plymouth.
Fisherman's Clothing.

524. **BRAND, H. & E.,** Broad Row and Trinity Quay, Great Yarmouth.
Grained Water-boots.
Entire Personal Equipment of Fishermen.
Life-size Models of Fishermen dressed for Sea or Shore Service.
Fishermen's Oiled and other Clothing.
Hand-knitted and other Guernseys.
Hand-knitted Mittens and Stockings.

525. **CRAIB, JAMES, & SON,** 20 Duff Street, Macduff, N.B.
Pair of Fishermen's Sea Boots.

526. **WILSON, WILLIAM,** Albert House, High Street, Berwick-on Tweed.
Pair of long Herring Fishing Boots.
Pair of long Salmon Fishing Boots.
Pair of Knee Deck Boots.
Pair of Knee Salmon Fishing Boots.
Pair of Wading or Shooting Boots.
Ladies' Rod Fishing Boots.
Gentlemen's Rod Fishing Boats.
Gentlemen's Waterproof Wading Stockings and Brogues complete.
All Waterproof.

527. **WENTWORTH, MESSRS.,** 12 Museum Street, London, W.C.
Short Yellow Fishermens' Oilskin Coat.
Long Yellow Oilskin Coat.
Short Black Oilskin Coat.
Long Black Oilskin Coat.
Short Brown Cloth Coat.
Short Blue Cloth Coat.
Oilskin and other Coats to be worn in transferring fish from Catcher to Carrier.

**SHAVING A PLEASURE.**

EDWARD SMITH'S 1s. HOLLOW-GROUND RAZOR is pronounced by all to be the most wonderful Razor ever introduced. It has stood the test of over three years, during which time thousands have been sold, retail only, at No. 3, Cheapside. It never requires grinding or setting, and is complete in case for 1s. 1d.; post free, 1s. 3d. My graduating RAZOR STROP is the best for sharpening razors ever introduced. By means of a screw, it graduates its elasticity, making it more or less elastic at pleasure. Its elasticity will prove invaluable to the unskilful operator, as it will prevent his incautiously bearing too hard upon the razor, and injuring its edge, at the same time enabling him to keep his razor in perfect order. Price 2s. 9d. and 3s. 9d., post free. Extra best quality, solid leather case and superior finish, 4s. 9d. and 5s. 9d., post free. The Diamond Razor Strop Paste, 7d., post free. The Magic Shaving Stick, 7d., post free. List of Shaving Tackle, post free.

EDWARD SMITH, Razor Maker, 3, Cheapside, London, E.C.

**ENTWORTH, MESSRS.**—*continued.*
Belts to be carried on board Fishing Smacks.
Oilskin "Combination" Suits for Fishermen.
Cloth "Combination" Suits for Fishermen.

**OHNSON, J. H., & SONS,** Great Yarmouth.
Fishing Apparel.

**HALL, JOHN,** 20 Shore, Macduff, N.B.
Collection of Fishermen's Sea Clothing, other than waterproof.

**SIEBE, GORMAN AND CO.,** 147 Westminster Bridge Road, S.E.
Diving apparatus for sponges.

**PILKINGTON, W.,** 180 East India Dock Road, Poplar, London, E.
Sample of 4 Pairs of Fishermen's Waterproof Sea Boots (Leather), suitable for wading and deep-sea fishing.

**PREIST & CO.,** 514 Oxford Street, London, W.
Preist's Patent "Exeter" Fishing Knife.
New and improved Smoking Knives for Fishermen.
Pic-nic Knives, and Knives with Combination of Knife, Spoon, and Fork for Fishermen.
Fly-fishing Scissors—Gut Trimmers, Fishing Plyers, and Disgorgers, &c.
Spring Fish-weighers.
Knives and Scissors, specially for fishermen generally, knives containing all necessary appliances for fishing purposes.

**CORNWALL, COMMITTEE FOR.**
Hand Knitted Guernsey.
Frocks and Sea Boots.

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## Division XXII.

### Food and medicine chests.

**WALKER & HARRISON,** Phœnix Biscuit Works, Ratcliff Cross, London, E.
Samples of Ship Biscuits, Flour, Peas, Oatmeal, &c.

*BY SPECIAL ROYAL APPOINTMENT.*

DAY, SON, AND HEWITT'S

**"ORIGINAL" STOCK-BREEDER'S MEDICINE CHESTS,**

FOR ALL DISORDERS IN

HORSES, CATTLE, CALVES, SHEEP, AND LAMBS.

**Prices, £2 16s. 6d. and £6 6s. each, Carriage Paid.**

**22 DORSET STREET, BAKER STREET, LONDON, W.**

533. **NESTLE, HENRI**, 9 Snow Hill, London.
Condensed Swiss Milk.
Milk Food.

534. **HENRY, JAMES HAY,** The Pharmacy, Macduff, N.B.
Specimens of Fishermen's Medicine Chests.
Exhibit of Henry's "Marine Saline," being an Effervescent Preparation containing some of the Saline Constituents of Seaweed and Sea-water.

535. **MITCHELL & MUIL**, Biscuit Manufacturers, Aberdeen.
Samples of various kinds of Sea Biscuits used by Fishermen.

536. **HOGARTH & CO.**, Aberdeen Works, Copperfield Road, Mile End, E.
Preserved Provisions of all kinds.

537. **WILLSON, C.**, Chemist, Grimsby.
Smack's Medicine Chest.

538. **WILKINSON, W. N.**, 15 St. John's Road, Longsight.
Pocket Filters.

539. **PREVET, C., & CO.**, late **CHOLLET & CO.**, 134 Fenchurch Street, London, E.C.
A glazed frame containing a "Mosaic," composed of Compressed Vegetables of various kinds, for use at Sea, as regularly supplied to Her Majesty's Government.
Two glass cylinders containing uncompressed Mixed Vegetables, and uncompressed Julienne Vegetables, preserved, for short cruises.
A whole Cabbage preserved dry by Exhibitors' special process.
Samples of Compressed Mixed Vegetables and Julienne as dietetic and anti-scorbutic food for fishermen and especially whalers.
Three tins, one of 16 lbs., one of 8 lbs., and one of 4 lbs., to show the three sizes of packages of Exhibitors' goods for use at sea.
Samples of various Consolidated Soups in tins, for use at sea.

THE LADIES'
ROYAL YACHTING ULSTER
BLUE CASHMERE LINED SCARLET.
*SOLE MAKERS:*
ANDERSON, ABBOTT, and ANDERSON,
37, QUEEN VICTORIA STREET, LONDON, E.C.

**YEATMAN & CO.**, 119 New Bond Street, London.
Yeatman's Yeast Powder, for making Bread, Pastry, Puddings, &c., without Yeast. Prepared, ready for the oven, in a few minutes. Also Yeatman's Indian Pudding Preparations, Yeatman's Custard Powder, Yeatman's Granulated Flavouring Essences, and Yeatman's Perfected Corn Flour, &c., &c.

**LINTON, R. T.**, Manufacturing and Pharmaceutical Chemist, Edinburgh and Leith. Office, 8 Nicolson Street, Edinburgh.
Medicine Chests suitable for Lighthouses, Yachts, Emigrant Ships, &c.
Thermoplastic Splints, likewise Splints for Fractures and Broken Bones.

**McCALL, JOHN, & CO.**, 137 Houndsditch, London.
Show Case of Preserved Meats in tins.
Paysandu Ox Tongues.
Australian Beef and Mutton.
Tasmanian Rabbits.
Western Meat Co.'s Rabbits.

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## Division XXIII.

### Models and plans of dwellings.

**MACLEAN, J. ARCHIBALD**, of Pennycross, Pennyghael, Isle of Mull, by Oban.
Plan of Carsaig Salmon Fishery Station, including Peet Ice Houses connected with same, &c., &c.
Also Fishermen's Dwellings.
Fisherman's Bothy as adapted to the Herring Fishing on the west coast of Scotland.

**DEAN, MRS. ELIZABETH**, 2 Godwin Road, Hastings.
Model of a Fisherman's Dwelling House and Furniture.

**MACKENZIE, R.**, Master of Works, Campbeltown, Argyleshire, N.B.
Model of Fishermen's Houses.
2 Plans of Do.

**THE PATENT VICTORIA STONE,**
**AS LAID in the Entrance Hall and Fish Market of the FISHERIES EXHIBITION, has been used by Eighteen Metropolitan Vestries; sixty miles (taken at seven feet wide) having been laid in London footways, where there is the greatest traffic in the world.**
Wharf and Office :—283A, Kingsland Road.
Works :—Stratford, Essex; and Groby Quarries, Leicester.

547. **GREENWOOD, WILLIAM, & CO.**, 60 Market Street, Manchester.
Ventilators, for Dwellings. Patent New Style Ornamental Ventilators, in the form of plaques, brackets, and china, parian, Dresden, &c., vases and ornaments, suitable for dwelling-houses, saloons, &c.

548. **BREBNER, THOMAS**, Builder, Fraserburgh, Aberdeenshire.
Model of Fishermen's Houses, with Plan.

549. **LAWRENCESON, L.**, Lerwick, Shetland.
Model of Fisherman's Cottage.

549a. **CHAMBERS, OLDHAM, & WILLINS, MESSRS.**, Architects, Bank Plain, Norwich.
Plans of Fishermen's Waterside Dwellings.

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## Division XXIV.

**Contracts of partnerships; insurances of, life, boats, gear, &c.; benefit societies.**

549b. **SHIPWRECKED FISHERMEN'S AND MARINERS' ROYAL BENEVOLENT SOCIETY, THE**, Hibernian Chambers, London Bridge.
Frame with Testimonial.
Frame with Testimonial.
Frame with Forms, &c.
Annual Publications.
Quarterly Publications.
Gold Medals.
Silver Medals.
Other Medals.
Flags, &c.
Serial Issues and Pamphlets.

549c. **THAMES CHURCH MISSION TO SEAMEN FISHERMEN, &c. (THE)**, 31 New Bridge Street, Ludgate Circus.
Various Exhibits illustrative of the Society's important effort to reach the deep-sea fishermen by means of Mission Smacks cruising with the fleets.

## CLASS III.—COMMERCIAL AND ECONOMIC.

### Preparation, Preservation, and Utilization of Fish and all Forms of Life included in Class V.

This class has been divided into two groups, consisting (1) of those products of the fisheries which by undergoing some process of preservation can be made available as useful articles of food for weeks, months, or even years after the fish so treated has been caught, and (2) others from which oils, manures, and materials applicable to mechanical, agricultural or ornamental purposes are obtained.

Attention may first be directed to the various modes of curing fish for edible purposes, and these are mainly included under salting and smoking, although simply drying in the air is sufficient in some cases as a rough mode of preservation. In our own country, and especially in Sweden and Norway among Continental nations, curing operations have long been extensively carried on, and wholesome competition between them to meet the requirements of the German and other markets has done much to ensure the strictest attention being given to the selection of the best fish and all that is necessary for perfection in curing. This especially refers to what is known in this country as the "White herring cure," a method of preservation which employs thousands of men and women in Scotland, and which a special Board of Fisheries takes under its immediate superintendence, and certifies with its brand on the casks if the curing has been properly done, and the curers desire the official marks. The preparation of white herrings is very simple, and essentially consists in packing the fish in salt, which soon turns to brine, and this method of preparation is termed the "wet cure." The same method is applicable to other kinds of fish, particularly to cod and ling, and with some little modification to pilchards, which in Cornwall and on the north coast of Spain are largely cured for the Mediterranean markets. The great distinction between the treatment of pilchards and other kinds of fish cured wet being in the fact of pilchards being piled up in alternate layers of fish and salt on the ground for a few weeks before they are finally packed with salt in the barrels. By this treatment a considerable quantity of useful oil is obtained from them, and the fish are rendered more palatable. The numerous examples of fish from various countries cured by merely salting and drying show how much may be done in preserving fish for food with little trouble and at a trifling cost. The important fisheries of Newfoundland well represent this method of curing. Another mode of preservation is that so familiar on our tables in the form of sardines cured in oil. This method is applied to several kinds of fish in foreign countries, but has been only tried in our own within the last few years, and that with young pilchards, the fish which in France are so largely cured and sold under the name of sardines.

Curing with salt and smoke is a more elaborate process, which is especially carried out in this country, and the several models of curing-houses here exhibited well illustrate the manner in which red herrings, bloaters and kippers are prepared for the home and foreign markets, and will be examined with general interest. This mode of curing has been enormously extended within comparatively recent years. Many people will be surprised to hear that

hardly more than thirty years ago, when trawling was beginning to be systematically carried on in the North Sea, haddocks were caught in such vast numbers that there was hardly any market for them, and the fishermen were ordered to bring only a certain number ashore. Tons of them were then thrown overboard again; but the plan of smoking these fish was suggested and proved so successful that quite a new industry resulted from it, and now smoked haddock is so abundant that it comes within the reach of almost the poorest of the population. The preservation in tins of everything which may be roughly included under the head of fish forms another very important industry, especially on the other side of the Atlantic, and large supplies are sent to this country, much of it to be again exported all over the world as well as for consumption on board ship; and this in addition to the well-known productions of our own manufacturers. The universal demand for fish in some shape, whether fresh or preserved, is constantly increasing; and when it is remembered that really good fish is only found in any abundance in temperate or cool climates, and that comparatively few countries are fortunate enough to possess a favourable coast under such conditions, the advantages of being able to preserve fish in a fit state for food for long periods so as to bear carriage all over the world cannot fail to be properly appreciated.

In addition to the various kinds of cured or preserved fish, numerous articles coming under the head of fish products deserve some attention. Such are medicinal oils, roes, sounds, gelatine and isinglass. These are for the most part the productions of northern climates, and wherever the cod fishery is carried on with the object of curing the fish, the livers and roes are carefully kept, and form an appreciable item in the results of the fishery. It is a matter of some interest that the success of the sardine fishery in the Bay of Biscay is largely dependent on the fishermen being supplied with plenty of cod-roe. It is used as bait, and after being broken up, the separated grains are plentifully scattered among the nets as they float in the water, and the sardines in their eagerness to obtain this attractive food, find their way into the nets and are caught. Caviare, one of the peculiar products of Russia, is prepared from the roe of various species of sturgeon, and undergoes little preparation beyond salting and pressing; but many examples will be observed among the productions of other countries, especially of Sweden, of the roes of several kinds of sea fish prepared in the same manner as the original Russian caviare. The refuse of fish is utilised to some extent by being converted into manure or fish guano; and sprats in this country during the height of the special season when these fish are most abundant and the ordinary markets are glutted with them, are sold in thousands of bushels direct from the fishing vessels, and conveyed inland by the neighbouring railways to be thrown on the fields. The different oils obtained from sundry kinds of fish, seals and whales, will attract attention from the many uses to which they are applied, especially for lubrication, and the true fish oils have a special value in the preparation of leather of various kinds.

Pearls, mother-of-pearl and tortoiseshell being the special productions of warm climates, are best represented in the exhibits of some of our colonial possessions and countries near the tropics. Ceylon pearls have been famous for centuries, and still take their place in the market, although the supply is small compared with that from the Persian Gulf and a few other localities. The shells of the pearl oyster are represented in various stages of growth and showing the nacreous lining of the same material as that of which the pearl itself is entirely composed. The mother-of-pearl, as this substance is called, is in these oysters

too thin and small to be useful for manufacturing purposes, and this beautiful material, so much used for ornamental work, is obtained from a much larger oyster, the shell of which is thick and massive, and whose value depends almost entirely on the shell itself, and not on the small pearls produced in it. A large collection of objects will attract attention from their beauty and the variety of purposes to which the skins of certain kinds of fish and reptiles are applied, notwithstanding their unpromising nature; and much interest will be felt in the beautiful display of coral, tortoiseshell and shell ornaments, and the several methods by which they can be turned to account.

Returning once more to the large subject of obtaining an abundant supply of fish as an article of food, we find numerous appliances for keeping the fish cool during transport from the sea to the market, and this section deserves careful examination, as the main principle of refrigeration or cooling here illustrated has an important bearing on the question of transporting other kinds of perishable food from distant countries. Finally, attention may be directed to the several plans and models of fish-markets with their arrangements for the quick receiving and delivery of the fish, and altogether it will be noted that large as are the interests of those concerned in the actual fisheries, those connected with the transport, preservation and disposal of the fish are hardly less important.

E. W. H. Holdsworth, F.L.S., &c.

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# JOHN MOIR & SON,

## LIMITED,

## LONDON, ABERDEEN, SEVILLE, AND WILMINGTON

**(DELAWARE, U.S.A.).**

### Purveyors to H.R.H. the Prince of Wales.

*Exhibit from their London, Aberdeen, and American Factories, the undernoted Fish, preserved in glasses and tins—*

**HERRINGS.**—Fresh Herrings, Kippered Herrings, Red Herrings, Devilled Herrings, Herrings in Shrimp Sauce, Tomato Sauce, and Fennel Sauce; Pickled Herrings, Herrings à la Sardines, Digby Chicks, Potomac Pickled Herrings, Fried Herrings, Spiced Herrings.

**HADDOCKS IN GLASSES.**—Fresh Haddocks, Findon Haddocks, Haddock Roes.

**SALMON IN GLASSES AND TINS (Scotch).**—Fresh Salmon, Collared Salmon, Salmon Cutlets, Salmon Cutlets in Sauce, Salmon Cutlets in Oil, Pickled Salmon with Vinegar, Salmon Cutlets in Indian Sauce, Kippered Salmon.

**COD FISH IN GLASSES.**—Fresh Cod, Compressed Cod, Cod Roes, Cod Fish Balls, Smoked Cod Roes, Cod Sounds.

**LING FISH IN GLASSES.**—Fresh Ling.

**TURBOT IN GLASSES AND TINS.**—Fresh Turbot, Turbot Cutlets.

**POTTED FISH IN GLASSES AND TINS.**—Lobster, Salmon, Shrimp, Bloater Paste, Anchovy Paste, Potted Turtle Meat, Potted Crab, Potted Findon Haddocks.

**MACKEREL.**—Fresh Mackerel, Kippered Mackerel, Mackerel in Sauce.

**SOLES IN GLASSES.**—Soles, Fried Soles, Fillets of Soles.

**LOBSTERS IN GLASSES AND TINS,** also Curried.

**OYSTERS IN GLASSES AND TINS.**—Fresh Oysters, Pickled Oysters, Curried Oysters.

**ANCHOVIES IN GLASSES.**—Gorgona, ditto in Oil.

**FISH SOUP IN GLASSES AND TINS.**—Fish Soup white, Terrapin Soup, Green Turtle Soup for Invalids, Real Turtle Soup clear and thick, Lobster Soup, Oyster Soup, Mulligatawny Fish Soup, Bouillabaisse, or French Fish Soup.

**VARIOUS FISH IN GLASSES.**—Green Turtle, Sturgeon, Sturgeon Cutlets, Potomac Herrings in Jelly, Chesapeake Bay Rock Fish, Delaware White Perch, Delaware Shad in Jelly, Florida Red Snapper, New England Brook Fish, Brandy Wine Suckers, Delaware Perch, Susquehanna Yellow Perch, Delaware Rock Fish in Jelly, Eastern Shore Common Terrapin, Chinconteagne Sound Diamond Back Terrapin in Jelly, Red Snapper Cutlets, Red Snapper Cutlets in Jelly, Red Snapper Cutlets with Oyster Sauce, Broiled Shad, Dried Sprats, Russian Caviare, Soft Speldings, Whitebait.

**SHELLS.**—Diamond Back Terrapin.

**SAUCES.**—Fish Sauce, Essence Anchovies, Essence Shrimps, Essence Lobster, Indian Sauce for Salmon Cutlets.

**CURRY POWDER.**—Specially prepared for Fish Curries.

**SARDINES.**—Sardines in Oil, Sardines in Butter, Sardines boneless, Sardines with Tomatoes.

## DIVISION XXV.

## COMMERCIAL AND ECONOMIC.

**Preparation, preservation, and utilisation of fish, and all forms of life included in Class V.**

## DIVISION XXVI.

**Fish dried, smoked, cured, salted, tinned, or otherwise prepared for food.**

(a) For edible purposes—
Models of fish-curing establishments. Methods of, and models and other representations of any appliances for, drying, curing, salting, smoking, tinning, cooking, &c.

50. **SAYER & CO.**, 100 Lower Thames Street and Billingsgate, London.
Model of Fish Curing Establishment, with all the latest improvements.

**SINCLAIR, GEORGE**, Ollaberry, Shetland, N.B.
Enlarged Photograph of Fish Drying before the Sun.

**FISHERY BOARD FOR SCOTLAND**, Edinburgh.
White Herring Cran Measure (1).
White Herring Barrel (1).
White Herring Half Barrel (1).
Six Gauging Instruments, viz., Set of Callipers (2), Slide Rule (1), Diagonal Rod (1), Imperial Gallon Measure (1), one-third Gallon Measure (1).
Five Branding Irons, viz., Crown "Full" Iron (1), do. "Mat." Iron (1), do. "Spt." Iron (1), do. "P" Iron (1), do. Cran Iron (1).

**PARK, J. & T.**, Fish Curer, Fraserburgh, N.B.
Model of Fish Curing Establishment, made to a scale.

**ARNOTT, H. DUDLEY**, Architect and Surveyor, High Street, Gorleston, Great Yarmouth.
Mounted Drawing of Herring Curing Premises designed to cure 60 to 65 lasts.

**ISLAY WHISKY.**
**W. & J. MUTTER, Bowmore Distillery, Islay.**
*Counting House*—41, ANN STREET, CITY, GLASGOW.
*Agents*—Messrs. TWISS & BROWNINGS, 47, Mark Lane, London.
THE ABOVE WHISKY TO BE HAD BY ORDERING THROUGH WHOLESALE HOUSES AND BROKERS.

555. **MOIR, JOHN, & SON, Limited,** 148 Leadenhall Street, London, E.C. Factories: London, Aberdeen, Seville (Spain), and Wilmington (Del. U.S.A.).

Models of Smoking Houses for Findon Haddocks, Kippered Herrings, and Red Herrings.

Exhibits of English, Scotch, and American Smoked, Dried, and Preserved Fish, in glass and tins, including Salmon, Findon Haddocks, Turbot, Whitebait, Soles, Lobster, Sturgeon, Shad, Potomac Herrings, &c.

556. **DICKSON & RENWICK,** of London, Liverpool, and Glasgow, 39 Lombard Street, London.

Salmon. A. Booth's Brand.
Oysters. A. Booth's Brand.
Lobster. Forrest & Co.'s Brand.
Salmon. Sovereign Brand. Tall tins. Columbia River.
Salmon. Sovereign Brand. Flat tins. Columbia River.
Mackerel. Sovereign Brand.
Herrings. Sovereign Brand.
Lobster. Sovereign Brand. Tall tins.
Lobster. Sovereign brand. Flat tins.
Oysters. Sovereign Brand.
Clams. Sovereign Brand.
Shrimps. Sovereign Brand.
Salmon, Smoked. Sovereign Brand.

557. **SUTTON, G. F., & CO.,** White Horse Yard, 100 High Holborn, London.

Gorgona Anchovies as imported, in original package.

Set of Samples of preparations of the above.
Specimen glasses: Fish prepared in various ways.

558. **PENEAU, JOSEPH,** for correspondence, 6 Martin's Lane, Cannon Street, E.C.

Collection of samples of Sardines in Oil, in Tins of various sizes.

559. **LATHAM, A. W., & CO.,** as Agents. 17 Philpot Lane, London, E.C.

Barataria Prawns in one and half lb. (nominal) Tin Cans.
Barataria Oysters in one lb. (nominal) Tin Cans.


# JOHN MOIR & SON, LIMITED,

## Preserbers of Fish, Soups, Meats, and Vegetables.

ESTABLISHED 1822.


**For Particulars of Exhibit see page 116.**

**LATHAM, A. W., & CO.**—*continued.*
The same Article put up in Alcohol in Show Glasses.
Columbia River Salmon, in 1 lb. Tall and Flat Tin Cans.
The same Article put up in its natural form in a large Tin Can.

0. **MACONOCHIE BROTHERS,** Raglan Works, Lowestoft, Suffolk.
Tinned Herrings, Mackerel. and other Fish.

1. **TULLOCH, WILLIAM & SON,** Export Provision Manufacturers, 26 and 27 Bury Street, London, E.C.
Preserved Salmon in Tins.
Preserved Lobster in Tins.
Preserved Fresh Herrings in Tins.
Kippered Herrings in Tins.
Bloater Herrings in Tins.
Herrings à la Sardine in Tins.
Finnan Haddocks in Tins.
Sardines and Sprats in Tins.
Oysters in Tins.
Bloater Paste in Tins.
Anchovies, &c., in bottles.
Fish Sauces in bottles.
Prawns in Tins.

562. **EDGAR, JAMES & CO.,** 23 Rood Lane, London, E.C., and North End Factory, Deal.
Various Preserved Fish in Tins.

563. **BARROW, GEORGE,** 118 Lower Thames Street, London.
Boxes of "High Dried" or "Red" Herrings, Samples of various qualities. Specially cured for Home Consumption and Exportation. Will keep thoroughly sweet for six months at least. A most nutritious article of food, and only requires to be more generally known to be appreciated.

564. **BUSH, MRS. ISAAC,** Alma Street, Wivenhoe, nr. Colchester, Essex.
Two Bottles, and two Jars of Cooked Pickled Sprats.

565. **BELLIS, THOMAS KERRISON,** 9, 10 Jeffreys Square, St. Mary Axe, London, E.C.
Samples of Sun-dried West India Green Turtle Calipash, Calipee, and Fins used for making real Turtle Soup.

ANDERSON, ABBOTT, & ANDERSON,
*MAKERS OF*
*FISHERMEN'S OILSKIN CLOTHING*
OF EVERY DESCRIPTION.
37, Queen Victoria Street, London, E.C.
WORKS: LIMEHOUSE, E.

**BELLIS, THOMAS KERRISON**—*continued.*
Samples of Preserved Green Turtle Calipash and Calipee in Tins and Bottles.
Samples of Turtle Green Fat.
Samples of Turtle Soup ready for use, in Tins and Bottles.

566. **GILLON, JOHN, & CO.**, Leith, N.B.
Preserved Fish in Tins—Salmon, Salmon Cutlets, Mackerel, Fresh Herrings, Kippered Herrings, Herring à la Sardines, Findon Haddocks, Red Herrings, and other Fish; also Turtle Soup, Anchovy Paste, and Bloater Paste.

567. **NOEL, LUDOVIC**, 43 Frith Street, Soho, London, W.
Sardines, Herring, Tunny Fish and Anchovies, &c.

568. **CROSSE & BLACKWELL**, Soho Square, London and Morrison's Quay, Cork.
Fish cured, salted, spiced, and otherwise prepared for food, in tins, bottles and jars.

569. **OVERALL, S., SON, & CO.**, 102 Lower Thames Street, and 77 Wapping Wall, London, and Peterhead, N.B.
Dried Fish in various packages for export. Salted, Pickled, and Preserved Fish (various), in Tins, Bottles, Kegs, Barrels, &c. Herrings, Smoked, Pickled, and Preserved in Barrels, Kegs, Tins, &c.
Fish Oil.

570. **BLANCHFLOWER & SONS**, Fish Curers, Exporters, Importers and Manufacturers of Fish Sauce, Pickles, Jam, Jellies, and Preservers of Fish, Meats, Game, Soups, Vegetables, Sausages, &c., for Yachts and Shipping purposes; and also Italian Warehousemen, King Street, Great Yarmouth.
Tinned, Dried, Smoked, Cured, and Salted Fish.

571. **BURGESS, JOHN, & SON**, 107 Strand, London.
Samples of Preparations of Anchovies, viz.:—
Gorgona Anchovies as cured.
Gorgona Anchovies, prepared in Brine, Vinegar, Oil, Butter.
Gorgona Anchovies, prepared as Sauce.

ANDERSON, ABBOTT, & ANDERSON'S
PORTABLE FOLDING
BATHS.
PORTABLE REGULATION BUCKETS AND BASINS.
WATERPROOF
KIT AND CLOTHES BAGS.
37, QUEEN VICTORIA ST., LONDON, E.C.

**KING, ROBERT,** 32 Sussex Place, S. Kensington, London.
Salmon in various forms.
Sardines.
Lobsters.
Prawns.
Tunny.
Char.
Lax.
Cod, Haddock, Herring.
Oysters, &c.
Isinglass.
Roes and Oils.

**EDMUNDS, JOSEPH,** 134 Pentonville Road, London.
Samplies of Anchovies in Brine, Vinegar, and Oil. Essence of Anchovies, Coloured and Uncoloured. Anchovy Paste. Bloater Paste.
"The Empress" Prize Medal Currie Powder in Packets, from One Penny each, a valuable accessory in the preparation of cheap Fish Dinners.

**GEDDES, JAMES,** Macduff, Scotland.
Model of Fish Curing Establishment.

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## FISH MARKET AND CORRIDOR.

**FLYNN, DANIEL,** Inch, Annascant, co. Kerry.
Shellfish.

**OVERALL & SON,** 102 Lower Thames Street, London.
Preserved, Salted, Pickled and Smoked Fish.
Fish Oil and Fish Sauces.

**ADIE, THOMAS, M. & SONS,** Voe, Shetland.
Sample ½ Barrel of White Herrings in Pickle.
Various Samples of Salted Sun-dried Fish in Cases.

MORSON'S PEPSINE PREPARATIONS OF
Highly recommended by the Medical Profession for
INDIGESTION.
As Wine in Bottles at 3s., 5s., and 9s.; Lozenges, 2s. 6d. and 4s. 6d.; Globules, 2s., 3s. 6d., and 6s. 6d.; and Powder, in 1 oz. Bottles, at 4s. each.
SOLD BY ALL CHEMISTS.
MORSON & SON, SOUTHAMPTON ROW RUSSELL SQUARE, LONDON

578. **SHARP & MURRAY,** Cellardyke, Fifeshire.
Smoked and Dried Fish, Pickled Cod, Pickled and Red Herrings for home and export markets.

579. **SINCLAIR, GEORGE,** Ollaberry, Shetland, N.B.
Smoked Trout, Dried Salted Ling, Cod, Tusk and Haddock.

580. **McCOMBIE, JAMES, & CO.,** Herring Merchants, and Fish-curers, Peterhead, Scotland.
Trade mark Cured Herrings, for Exportation, viz.:
1 Barrel Large Full Herrings.
1 Barrel Medium Full Herrings.
1 Barrel Mattie Herrings.
1 Barrel Spent Herrings.
Pickled and Dried Cod Fish.
Model of Exhibitors' Fish Curing Establishment, Peterhead.

581. **RAWLINSON, E.,** 1 Castle Crescent, Scarborough.
Kippered and Smoked Fish.

582. **BOYLE, J. S.,** Forfar and Gourdon, By Bervie, N.B.
Collection of Close-Smoked Cured Haddocks and Whiting, cured to keep about one week at least in summer, and about ten days in winter.

583. **BALTIMORE FISHERY COMPANY,** Skibbereen.
One Cask of Pilchards.

584. **CALDERWOOD, ROBERT,** Fish Merchant, Greenock, Scotland.
Two Half Barrels Cured Lochfyne Herring.

585. **GRAHAME, W. G.,** 131 High Street, Dunbar, N.B.
A box of Smoked Haddocks.

586. **WARD, H. S., & CO.,** 58 Holborn Viaduct, London.
Tinned Salmon, Columbia River, packed by Wm. Hume, Astoria.
Tinned Prawns, Gulf of Mexico, packed by T. T. White & Co., New Orleans.
Tinned Oysters, packed by L. McMurray & Co., Baltimore, Ma.
Tinned Tunny Fish, Italy, packed by Eugenio Bayon, Genoa, Italy.
Tinned Lobster, Nova Scotia, packed by G. M. D. Littell & Co.

DAVID SCOTT & CO.,
BROKERS AND COMMISSION MERCHANTS
LOBSTERS, and ALL DESCRIPTIONS of PRESERVED MEATS and FRUITS.
9, North John Street, Liverpool.

**ICE, JOHN,** Fish Curer, Haroldswich, Shetland.
ured Fish.

**NCHFLOWER & SONS,** Great Yarmouth, Norfolk.
'inned, dried, smoked, cured, and salted fish.

**HUEN, JAMES, & CO.,** Leith, N.B.
cotch Cured Fish of all kinds in Barrels, Boxes and Tins.

**S, JOHN, JUN.,** Muchalls, near Stonehaven.
'ish Cleaning Machine.
Iodel "Aberdeen Finnan" Curing Establishment.

**WLES, JAMES,** Fish Curer, Stonehaven, Scotland.
moked Cod and Ling.
)ried Salt Cod and Ling.
moked Yellow Haddocks.
moked and Roasted Haddocks.
'ickled Cod Fish.
alt Herrings in Barrel, etc.

**VE, JAMES,** Fish Curer, Cullen.
)ried, Smoked, and Cured Fish of all kinds common in Moray Firth.

**WFORD, A. O.,** Wick.
)ne Barrel White Herrings.
)ne Barrel Red Herrings.
)ne Barrel Pickled Cod.

**Y, JOHN,** Fish Curer, Whinnyfold, Ellon, Aberdeenshire.
Box Blown White Haddocks.
Box Dried Smoked Haddocks or Spaldings.
Box Smoked Haddocks.
Barrel Pickled Cod Fish.

**PSON, J.,** Wick, N.B.
)ne half barrel of white salted herrings.
)ne empty half barrel.
)ne do. whole do.

**PHEN, ROBERT,** Fish Curer, King Street, Peterhead.
)ne Barrel of Cured Pickled White Herrings.

**ADIES' WATERPROOFS**
**In French Tweeds. Very Light and Elegant.**

**DERSON, ABBOTT, AND ANDERSON,**
**7, Queen Victoria St., London, E.C.**

596. **MOWAT, ROBERT,** Fish Curer, Lybster, N.B.
Pickled Herrings of Lammas Cure 1882.
Pickled Codfish.
Bottle of Pickle for Cod.
Specimens of Herring Barrels.

597. **DAVIDSON, PIRIE & CO.,** Fish Curers, Leith.
One Barrel Yarmouth Red Herrings, (Cured for Home Market).
One Barrel Scotch (West Coast), (Cured for Home Market).
One Half Barrel Full White Herrings, (Cured for Continental Market).
Two Half Barrels Yarmouth Herrings, (Cured for Home and Irish Markets).
Two Firkins, gutted and ungutted, Loch Hourn White Herrings.
Two Kegs Lochfyne Herrings, (Cured for Home Market).
Half Barrel and 6 Tins Yarmouth Reds, (Cured for Colonial Market).

598. **RITCHIE, JAMES,** 11 Windmill Street, Peterhead, N.B.
One or two Boxes Kippered Herrings.
1 Barrel Pickled Cod Fish.
1 Half Barrel Smoked Red Herrings.
1 Half Barrel Pickled Cured White Herrings.

599. **BRIDGMAN, H. H., F.R.I.B.A., CAYLEY, J. J., AND BOYES, J.,** 42 Poultry, E.C.
Scheme for Wholesale, Semi-wholesale and Retail Fish Market for London between Waterloo Bridge and Charing Cross Railway Bridge, Lambeth side of the Thames, utilizing reclaimed foreshore, with communication by Rail (on to the market floor), River, and Roads. Plans, model, &c.

600. **MITCHELL, JOHN,** Fish Curer, Whitby.
5 Kits Black Herrings.
20 Boxes Smoked Herrings.
5 Firkins White Herrings, in Brine.

601. **CAMPBELL, ROBERT,** 13 Breadalbane Crescent, Pulteney town, Wick, N.B.
Fish Dried, Smoked, Cured, Salted, Tinned, or otherwise prepared for Food.
One Barrel Cured Cod.

For Watering Gardens and Lawns, Washing Carriages, Floors, and Ships' Decks, and all necessary
INDIA-RUBBER HOSE.
Fittings, etc.
37, QUEEN VICTORIA ST., LONDON, E.C.
ANDERSON, ABBOTT, & ANDERSON.

**MPBELL, ROBERT**—*continued.*
Two Barrels Pickled Herrings (measurement of one Barrel given).
Two Half Barrels Pickled Herrings (measurement of one half Barrel given).
Half Barrel Cod Sounds.

**OMSON, D. D., & CO.**, 24 Giles Street, Leith, Scotland.
White and Red Herrings.
Smoked Sprats.
1 Barrel White Herrings.
2½ Barrels White Herrings.
1 Barrel Red Herrings.
2½ Barrels Red Herrings.
12 Tins Red Herrings.
20 Packages Smoked Sprats.

**LLE**, 18 & 19 Coventry Street, Haymarket, London.
Oysters, shell fish, &c.

**RDETT-COUTTS, W.**, 1 Stratton Street, London.
Fish.

**IREIBER, C.**, Saint Margaret's College, Lowestoft.
A Jar of "The Royal Pickled Herring."
Do. The Queen's Herring Rolls.
Do. Ye Royal Herring Ragout.
Do. Capt. Schreiber's Pickled Sprat Anchovy.
Do. "Preserved Pilchard," or rather a description of a New Method for Curing and Preserving Pilchards for home consumption.
Capt. Schreiber's "Campaign Sauce."

**RMACK, JOHN**, Fish Curer, Lybster, N.B.
Barrel Crown Full Branded Herrings.
Barrel Crown Full Branded Herrings.
Barrel White Herrings, Cured Ungutted.
Barrel Cod-fish Cured in Pickle.
Cod and Ling Cured, Dried.
Two Kits Cods Sounds.
Fish Dried, Smoked, Cured, Salted, Tinned, &c., for food.
Herring Barrel and Half Barrel, New.
One Box of Kippered Herrings.

S. & H. HARRIS'S
RITISH
POLISHING
PASTE.
FOR CLEANING ALL METALS AND GLASS.
Sold by all Dealers throughout the World.

607. **COWIE BROS.**, Green's Harbour, Berwick-on-Tweed.
Smoked Findon Haddocks.
Smoked Herrings.

608. **DAVIDSON, WILLIAM, JUN.**, Fish Curer, Pulteneytown, Wick.
One Whole Barrel White Cured Herrings, original packing, ordinary cure for export to Baltic, cured in August 1882.
One Half Barrel White Cured Herrings, original packing, ordinary cure for export to Baltic, cured in July 1882.
One Half Barrel White Cured Herrings, original packing, ordinary cure for export to Baltic, cured in August 1882.

609. **GARRIOCK & CO.**, Shetland.
Case containing about 1 cwt. Dried salted Codfish, 1st quality, of which more than 1000 tons are exported annually to Spain, where it commands the highest price of any dried fish. It is there called "Bacalao Escocia."
Case containing about 1 cwt. Dried salted Ling fish, 1st quality, as exported to all parts of the world in casks or tin lined cases.
Case containing about 1 cwt. Dried salted Tusk-fish, caught in comparatively small quantities, mostly consumed in Scotch Markets.
Case containing about 1 cwt. Dried salted Saith fish, prepared for and mostly consumed in Ireland.

610. **GILLINGS, JAMES**, 19 Havelock Road, Great Yarmouth.
Collection of Cured Fish.
Model of Fish-Curing Establishment upon a new and improved principle.
Working Model of Fish-Curing Establishment.

611. **SCHELL, FELIX**, 81 Wigmore Street, London, W.
Live Foreign Crayfish, in various sizes and varieties.
Fish Soups (preserved).

612. **WOODGER, HENRY LAMBLE**, 9 Haddo Terrace, Scarboro, Yorks.
Black Herrings, and Ham Cured Red Herrings.

**ANDERSON, ABBOTT, AND ANDERSON'S**
37, Queen Victoria Street,
London, E.C.
WATER AND AIR BEDS
are invaluable to Patients in preventing Bed Sores, and giving great ease and comfort.

**'ACY-WATSON, C., & CO.,** Yare Fishery Works, Great Yarmouth.
Samples of Smoked Herrings (Silver Cure) in Barrels for Exportation.
Samples of Smoked Herrings (Golden Cure) in Barrels for Exportation.
Samples of Ham Cured Bloaters in Tins.
Samples of Red Herrings in Kits.
Samples of Yarmouth Golden Digby Chicks in Tins Hermetically Sealed.
Samples of Pickled White Salted Herrings in Barrel.

Samples of White Salted Herrings in Tins.
Samples of Gipped Herrings in Barrel.
Samples of Ham Cured Herrings in Anti-Pilferage Package.

**BARROW, G.,** 118 Lower Thames Street, E.C.
Dry Fish.

**BARBER, S. & CO.,** 111 Lower Thames Street, E.C.
Shell Fish.

**WILLIAMSON, L.,** Burravoe, Shetland, N.B.
Salted Dried Ling.
Salted Dried Tusk.
Salted Dried Cod.

**BAYER & CO.,** 100 Lower Thames Street, and Billingsgate, London.
Dried Fish of all kinds.

**DOULL, GEORGE,** Fish Curer, Wick, Caithness, Scotland.
Cured Herring in Barrels and Boxes.
Cured Cod in Barrels and Boxes.
2 Barrels Pickled Herrings, Governemnt brand, crown full.
2 Half Barrels Pickled Herrings, Government brand, crown full.
2 Quarter Barrels, Pickled Herrings.
1 Barrel Pickled Cod.
2 Boxes Smoked Herrings.

C. STACY-WATSON AND CO.'S
CELEBRATED
YARMOUTH HERRINGS.
For Price List address—Yare Fishery Works, Gt. Yarmouth, England.
IX HIGHEST AWARDS. *Norwich, Great Yarmouth, London.*

620. **DARNELL.**
Wet Fish.

621. **GEDDES, JAMES,** Macduff, Scotland.
Herrings Salted, Cured in Brine, Codfish Cured in Pickle, Codfish Dried, Home and Foreign Market. Haddocks Cured, Smoked, and Dried, &c.

622. **SWEETING & CO.,** 158 & 159 Cheapside, London.
Wet Fish.

623. **TOWELL, H. J.,** 33 Strand, W.C.
Wet Fish.

624. **CHARLES, J. S.,** 9 Lower Grosvenor Place, S.W.
Wet Fish.

625. **SMITHERS, GEORGE, & SONS,** Cannon Street Station, E.C.
Wet Fish of all kinds.

626. **GRIMSBY COMPANY.**
Wet Fish.

627. **OVERTON,** Victoria Station.
Wet Fish.

628. **HALL, JOHN,** 15 High Street, Kensington.
Wet Fish.

629. **WYATT, JAMES,** 123 Gloucester Road, South Kensington, S.W.
Wet Fish.

629*a*. **STUART & CO.,** 8 Thomas Street, Edinburgh.
Slab of Granolithic Paving for Fish Markets and Fishermen's Houses.
Patent Granolithic Tank.

S. & H. HARRIS'S
WATERPROOF DUBBING
FOR SOFTENING AND RENDERING BOOTS & SHOES WATERPROOF.
Sold by all Dealers throughout the World.

RENCE.
'et Fish.

IAM.
'et Fish.

'ATT, R., Lybster.
ecimens of Herring Barrel, Half Barrel and Ferkin.
wo barrels Lammas cured Pickled Herrings 1882.
wo barrels Pickled Codfish.

EYARD, J. F., 110A Waterloo Road, S.E., 77 Bishop's
l, Bayswater, and Railway Approach, Waterloo Station.
et Fish.

et Fish.

BS, J., 80 Lower Thames Street, and Billingsgate.
et Fish.

RAM & ROBERTS, Crystal Palace.

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DIVISION XXVII.

products prepared from fish, such as oils, roes, isinglass, &c.

IAM, JAMES, New George Street, Glasgow.
edicinal Cod Liver Oil.

Y & SONS, Wick, Scotland.
hn o' Groat Sauce, "The National Sauce of Scotland."

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WATERPROOF DRIVING
ONS AND KNEE RUGS.
IDERSON, ABBOTT, & ANDERSON,
Queen Victoria Street, London, E.C.

641. **SOUTHALL BROS. & BARCLAY,** Birmingham.
Cod Liver Oil and Cod Liver Oil derivatives.
Fish Oils used in Medicine and their constituents.
Medicinal preparations of Cod Liver Oil.

642. **SMITH, THOS. JAS.,** 10 and 11 North Church Side, Hull.
Cod Liver Oil, Norwegian, "Paragon."
Cod Liver Oil, ditto.
Cod Liver Oil, ditto, Light Brown.
Cod Liver Oil, Newfoundland.
Cod Liver Oil, Scotch.
Cod Liver Oil, Yorkshire Coast.

643. **HENRY, JAMES HAY,** Pharmaceutical Chemist, Macduff, N.B.
Specimens of Scotch and Norwegian Cod Liver Oil, and other Fish Liver Oils.

644. **CORMACK, THOS., & SONS,** Cod Liver Oil Manufacturers, Eyemouth.
Medical Cod Liver Oil in Show Case.

645. **LINTON, RALPH TAIT,** Pharmaceutical and Manufacturing Chemist, Edinburgh and Leith. Office:—8 Nicolson Street, Edinburgh.
Medicinal Cod Liver Oil, various kinds.
Cod Liver Oil Emulsions.
Whale Oil.
Sperm Oil.
Spermaceti.
Kelp Iodine and Iodine of Potassium, and other preparations prepared from Sea Weed, and other preparations used in Medicine.

646. **SHARP & MURRAY,** Cellardyke, Fifeshire.
Cod and Ling Roes.
Cod Sounds.

*ANDERSON, ABBOTT, & ANDERSON'S*
IMPROVED FISHING BAGS.
STRONG AND WELL MADE.
**37, Queen Victoria St., London, E.C.**

. **McCOMBIE, JAMES, & CO.**, Herring Merchants, and Fish-curers, Peterhead, Scotland.
Cod Liver Oil, viz.:—
Medicinal Oil.
Curriers' Oil.

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DIVISION XXVIII.

**Antiseptics suitable for preserving fish for food.**

. **RENSHAW, JAMES**, Northwich, Cheshire.
Fishery Salt, Double Extra Rough.
Fishery Salt, Extra Rough.
Fishery Salt, Best Scotch.
Fishery Salt, Seconds.
Common Salt.
Middle Grain Salt.
Table Salt.
Specimen of Bay Salt.
Specimens of Rock Salt.

. **CORBETT, JOHN**, M.P., Stoke Works, Worcestershire.
Samples of Salt for fish curing.
Natural Brine.
Samples of Salt for Provision-curing, Household, and general purposes.

. **DROITWICH SALT CO., Limited**, 8 and 9 Lower Thames Street, London, E.C.
Fishery Salt for fish curing.
Broad Salt for fish curing (medium or coarse).
Table Salt, Kitchen Salt, Dairy Salt, Fine Salt (in blocks), Bay Salt (large crystals), Fine Salt (broken for export), Brine (from which the salt is produced).

. **BUMSTED, D., & CO.**, 36 King William Street, London Bridge.
Various kinds of Salt, suitable for preserving fish for food.

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GRIMBLE & CO.'S VINEGAR,
(Gold Medal, New Zealand, 1882)
PURE WHITE, BROWN, AND STRAW-COLOURED,
FOR FISH-CURERS, PICKLERS, AND ALL PURPOSES.
*PRICES AND TERMS ON APPLICATION.*
CUMBERLAND MARKET, LONDON, N.W.

652. **GOW, JOHN.**
Salt for preserving fish.

653. **SANITAS COMPANY, Limited,** Three Colt Lane, Bethnal Green, London, E.
Sanitas Antiseptic and Disinfecting fluid; an aqueous solution of Peroxide of Hydrogen and other substances for preserving fish, &c.
Sanitas Antiseptic and Disinfecting Oil; an oxidised turpentine for preserving fish, &c.
Samples of Fish preserved by the Sanitas preparations.

654. **ANTITROPIC COMPANY;—W. F. GRIER & CO.,** Glasgow, and 20 Stamford Street, Blackfriars, London, S.E.
Glacialine, for Household Use, to preserve fish in a sound and fresh condition for a few days in the hottest weather. Put up in a portable form, very convenient for the household, in packets, boxes and canisters.
The Antitropic Fish Preservative (put up only in casks of a hundredweight and upwards) for preserving Fish at the place of capture, so that they may be transmitted in a sound condition without ice to distant Markets.
Specimens of Fish preserved by above substances.
Microscopic Specimens of interest to Pisciculturists.

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## Division XXIX.

(*b*) For other than edible purposes—
Oils, manures, and other products prepared from fish.

655. **CARR, WILLIAM GRAHAM, & SON,** 63 High Street, Berwick-on-Tweed.
Oils made from the Livers of Cod, Haddocks and Skate. Also Porpoise, Seal and Whale Oils, &c., from the coasts of England, Scotland, Norway, Newfoundland, &c.
Stearine used for making candles from the deposit of Cod Liver Oil and Oil for dressing leather.
Oilcake for feeding Cattle from the refuse of Cod Livers.

Dry and Liquid Manures from the refuse of the above oils.

ANDERSON, ABBOTT, & ANDERSON'S
FOR DRIVING, RIDING, SHOOTING, FISHING,
WATERPROOFS
YACHTING, BICYCLING, AND GENERAL WEAR.
37, Queen Victoria Street, London, E.C.
WORKS: LIMEHOUSE, E.

**AUGHRIN, WILLIAM,** Polperro, Cornwall.
Oils, ½-pint bottles. Samples showing how much Oil can be produced from certain weights of liver in following fish:—
Torpedo Ray.
Common Ray.
Ling.
Conger Eel.
Dogfish.
Cod.

**BLUNDELL, SPENCE, & CO., Limited,** 9 Upper Thames Street, London, and Hull.
Cod and Whale Oils for tanning and leather dressing.
Sperm, Seal and Shark Oils for burning.
Sperm Oil for machinery and soap-making.
Porpoise, Herring, Sardine and Train Oils.

**DALES, JOHN T.,** 287 Crystal Palace Road, London, S.E.
Dales' Porpoise Oil Dubbin for waterproofing, preserving and softening boats, harness and leather goods; also useful as a kid reviver. Rats or mice will not touch leather on which this dubbin is used.

**DINTON, RALPH TAIT,** Pharmaceutical and Manufacturing Chemist, 8 Nicolson Street, Edinburgh.
Spermaceti and preparations.
Sperm Oil and Whale Oil.
Kelp, Iodine, and Iodide of Potassium.

**DINCLAIR, WILLIAM,** Drumbeg, Donegal.
Collection of Oils extracted from livers of different varieties of Dogfish and specimens of the fish in different stages of preparation for manure.

**ANGLO-SWEDISH COMPANY, Limited,** 23 Old Change, E.C.
Oils and Guano products of Fish, from the Company's works at Grötö Lysekit, Sweden.

**ANDERSON, ABBOTT, & ANDERSON'S**
37, Queen Victoria Street,
London, E.C.
LAWN TENNIS
BATS,
BALLS, SHOES,
NETS, POLES, BAGS.
SETS COMPLETE.

## Division XXXI.

**Sea and fresh water pearl shells; mother of pearl manufactured; pearls sorted.**

## Division XXXII.

**Preparation and application of sponges, corals, pearls, shells, and all parts and products of aquatic animals, &c. to purposes useful and ornamental, with specimens.**

661. **ABRAHAMS, ARTHUR,** Crystal Palace, Sydenham, S.E.
Collection of Rare Shells.
Shells manufactured for useful and ornamental purposes, with rare specimens.
Useful Articles manufactured from mother of pearl, and Pearl Shell Ornaments.
Specimens of Coral.

662. **BIGLIOSCHI, V.,** 101 Ledbury Road, Bayswater, W., London.
Collection of Pearls, Shells, Manufactured Imitation of Pearls, Shells, Corals, &c.
Algæ arranged and mounted as pictures.

663. **JARDINE, MRS. ALFRED,** 18 Albion Square, Dalston.
Corals and Shells.

664. **SINCLAIR, GEORGE,** Ollabery, Shetland, N.B.
Pearls and Shells applied for manufacturing purposes.

665. **GRECK & CO.,** 9 Rathbone Place, Oxford Street, W.
Coral, Jewellery, Necklaces, Brooches, Cameos, Lentils, Beads, &c.

666. **SAMUEL, M., & CO.,** 31 Houndsditch, London, E.C.
Shell Boxes and Cushions.
Shell Collars and Bracelets.
Engraved and Painted Shells.
Suspended Shells for Flowers.
Flowers made of Shells.
Lobster-men.
Flower Stands.

Ye Spider and ye Fly Brooch, 5s. 6d.
LATEST FROM PARIS, CATSEYE AND REAL PEARL JEWELLERY.
STAG BEETLES, BUTTERFLIES, FROGS, AND LITTLE DUCK BROOCHES.
NEW DIAMONDS, SPANISH CRYSTALS, RINGS SET IN GOLD, 10s. 6d.
Earrings, Bangles, Studs, Pins, Necklets.
MORRELL'S, JEWELLER,
60, 61, 42, BURLINGTON ARCADE, PICCADILLY, W.

**SAMUEL, M., & CO.**—*continued.*
Purses and Shell Jewellery.
Shell Men.
Pearl Shells (rough).
Pearl Shells (cleaned).
Mother of Pearl manufactured.
An Entire Suite of Boudoir Furniture in Mother of Pearl.

**MACNEE, JAMES,** Loch Tummel Side, Pitlochry, Perthshire.
Case containing Scotch Pearl Shells. Pearl Bearing and Non-pearl Bearing classes.

**BOROUGH LEATHER WAREHOUSE COMPANY,** 134 High Street, Southwark, London, S.E.
Entire Skin of Alligator, mounted and stuffed, &c.

Entire Skin of Alligator, mounted and stuffed, &c., smaller.

Prepared Alligator Skins, tanned and dressed; various colours.
Saddles, Boots, Slippers, Dressing-bags, Whips, Cigar Cases, Cigarette Cases, Fusee Cases, and other articles, all of Alligator's Skin, showing its application to purposes of commerce.
Various further articles, Penholders, Photo Frames, Purses, Card Cases, &c., all of Alligator's Skin.
Albums and Books bound in Alligator Skin.
Prepared and Dyed Pearly Back Ray-fish Skins.
Cabinet, outside mounted with Ray-fish Skin (pale grey colour, inlaid in Argenton or Inoxidisable Metal with Ebony —unique and extraordinary piece of furniture. Chair of same material. Mirror ditto; showing application of Ray-fish Skin to articles of decorative art.
Two Ladies' Work Tables of Inlaid Ray-fish Skin—same colour, mounted with engraved Argenton or Inoxidisable Metal. Two Jardinières of same material, one inlaid in Ebony, and one not inlaid in Ebony.
Sets of minor articles, such as Glove Boxes, Cigar Boxes, Cigar Cases of same material, in silver or metal mounts.

Specimens of Tanned, Prepared and Finished Serpent Skins (Boa Constrictor and Python), &c.

NDERSON, ABBOTT, & ANDERSON'S
7, Queen Victoria Street,
ondon, E.C.
LAWN TENNIS
BATS,
BALLS, SHOES,
NETS, POLES, BAGS.
SETS COMPLETE.

**BOROUGH LEATHER WAREHOUSE COMPANY**—*continued.*

Sets of articles made from Serpent Skin, Blotting Cases, Ladies' Belts, Purses, Pocket Books, and various leather work of Serpent Skins; showing their application to articles of utility.

668. **JACQUES, JOHN**, Royal Aquarium, Westminster, London.
Samples of Coral and Shell Ornaments.
Sets of Ornaments manufactured out of Pearl.
A variety of Shell Ornaments.
Fish Scale Ornaments.
Venetian Shell Ornaments.

669. **DAVIS, A. A.**, 46 Buckingham Road, Southgate Road, London, N.
Specimen of Corals, Pearls, Shells, Conger Shells, Helmet Clam, Cabinet Shells, Venetian and Rice Shells.
Shells carved by hand and Shell Works.
Cameos made from Sea Pebbles and other Ornamental Works, &c., &c.

670. **VOTIERI, JOHN**, 315 Camden Road, Holloway.
Collection of Shell Cameos, made of a variety of Shells, Engraved Shells, and Corals, &c.

671. **WARD, ROWLAND, & Co.**, Naturalists, 166 Piccadilly.
Special inventions and adaptations of LOBSTER and OYSTER SHELLS for all Table purposes, mounted in silver and other metals. Registered designs.
Fish, in action.
Studies in entirely new designs, invented by Rowland Ward, F.Z.S. The real skins mounted.
Fish Skin, Pikes' Heads, Sharks' Jaws, Whales' Vertebræ, Teeth, Crocodile Hide and Teeth, Turtle and Tortoise Shells, &c., &c., utilized in original designs by Rowland Ward, F.Z.S.

672. **KING, W.**, 30 Hardwick Street, Dublin.
Collection of Rough Sea Shells and Shell Work.

673. **TULLEY, W. S.**, 65 East Street, Brighton.
Corals and Shell Collection to ornamental purposes.

**ANDERSON, ABBOTT, & ANDERSON'S**
37, Queen Victoria Street,
London, E.C.
LAWN TENNIS
BATS
BALLS, SHOES,
NETS, POLES, BAGS.
SETS COMPLETE.

**ESSWELL,** Red Lion Square, London.
Sponges, &c.

**FFO, W.,** 142 Hampstead Road, London, N.W.
6 Coral Sets completed.
12 Half Coral Sets completed.
12 Pairs Coral Earrings.
24 Coral Gentlemen's Pins.
12 Pieces Coral Hair Ornaments.
24 Coral Sets, Studs and Cuffs.
Collection of small Utensils of Manufacture. Models made on purpose to show how manufacture is done with rough material in the different stages of manufacture.
4 Tortoiseshell Parasol Handles.
36 Tortoiseshell Sets Re-sorted.
6 Tortoiseshell Bracelets.
6 Tortoiseshell Hair Ornaments.
4 Dozen Coral and Tortoiseshell Charms.

**ELLS, JAMES,** Aquarium, Scarboro'.
Collection of Fish Scale Ornaments—large and small. Coral Fine Art Jewellery. Shells—great assortment—including Conger, Helmet, Clam, Cabinet, Venetian, and Rice, &c.

**ARKWALD & CO.,** 2 Talbot Court, Gracechurch Street, E.C.
Collection of Rough Amber, found in the Baltic Sea, showing the different kinds, colours, and qualities in existence; also curious specimens and pieces enclosing insects, Plants, Wood, &c.

**RNSTEIN, PHILIP,** 22 Falmouth Road, New Kent Road, S.E.
Corals, assorted.
Specimens, useful and ornamental.
Collection of Pearls, real and imitation.
Shells, assorted.
Shells, partly manufactured.
Shells, manufactured to purposes useful and ornamental.
Walrus Teeth, manufactured in articles useful and ornamental.
Fish-skins, manufactured in articles useful.

**ORTIMER, M. A.,** 1 Blessington Street, Dublin.
Irish Shells in their natural state, and some manufactured into ornaments and other shells.

**ROIDE GOLD JEWELLERY**
**REGISTERED).—THE PERFECT SUBSTITUTE FOR GOLD.**
**ATCHES,** in elegant designs, equal in beauty and utility to 18-carat, 21*s.*, 25*s.*, 30*s.*; **ALSO, &c.** Warranted accurate timekeepers.
**OCKETS,** to hold two portraits, set with pearls, coral, &c., highly finished, 3*s.* 6*d.* to 10*s.* 6*d.*
**LBERT** and other **CHAINS,** fine gold patterns, 5*s.*, 7*s.* 6*d.*, 10*s.* 6*d.* Studs, Links, &c.,
**Scarf Pins,** 1*s.*, 2*s.*, 2*s.* 6*d.* Every article of jewellery safe and free per post.
*Opinions of the Press and Illustrated Price Lists (New Edition) free.*
**J. C. ROWE,** 92, BROMPTON ROAD, LONDON, S.W. (Established 1870.)
Within Five Minutes' Walk of the Fisheries Exhibition.

680. **MARSH, JOHN VICTOR,** 175 Piccadilly, London.
Collection of goods made with (or partly of) Tortoiseshell.

Collection of articles made with (or partly of) Mother of Pearl.
Specimens of Unprepared and Prepared Cuttle Fish.
Specimens of Whalebone Brushes.
Collection of Sponges.

681. **FERGUSON, MARY,** Mill Hill House, Musselburgh, N.B.
A Collection of Flowers made of Fish Bones.
This exhibit consists of a variety of flowers, made of bones, teeth, and eyes, taken from the heads of several kinds of fish, such as the cod, haddock, herring, &c. They are imitations of natural flowers.

682. **MELILLO, G.,** Brighton.
Corals, &c., applied to manufacture.

683. **MAPLES, MISSES H. & E.,** Elmsford House, Spalding.
Folding Screen, Small Tablecloth, and other articles of a useful and ornamental character worked on cloth or satin with fishes' scales.

684. **DE GIOVANNI, G.,** Cavaliere, 38 Wellington Street, Camden Town, London.
Shell cut, representing the toilet of Venus.
Shell cut, group, the Amphitrite.
Corals.
Cameo Portrait of the Right Hon. W. E. Gladstone, M.P.—taken from life.
Cameo Portrait of the late Doctor Billing—from life.

685. **MAPPIN & WEBB,** Oxford Street, London.
Articles made from Pearl and other Shells.

686. **DAVIDSON, JOHN,** Jeweller, Wick, N.B.
A collection of Brooches, Earrings, Lockets, Bracelets, Scarf Pins, Rings, Studs, and Necklets, formed of shells from John o' Groat's," set in silver and gold.

687. **NEAPOLITAN CORAL COMPANY,** 73 Hatton Garden, London, E.C.
Collection of Corals, Rough and Polished.

**ANDERSON, ABBOTT, & ANDERSON'S**

BOOTS, TROUSERS, STOCKINGS, **FISHING** BROGUES, BAGS, COATS,

ARE UNEQUALLED.

8. **MARSHALL, JOHN,** 92 Peckham Park Road, London, S.E.
Giant Cement (prepared from Isinglass) for repair of Aquaria, Fishing appliances, and the preservation of aquatic specimens.

9. **DAVIES, STEPHEN,** 50 Fann Street, Aldersgate St., E.C.
Specimens of Shells manufactured and in natural state; also Sea Ivories, Horns, Bone, &c., manufactured and rough.

10. **SMALL, J. W.**
Corals, &c., applied to manufacture.

11. **BRASSEY, LADY,** Normanhurst Court, Battle.
Unique Necklace of twenty-five very large Coral Beads (Corallum rubrum), weight 5 oz. 18 dwts.
Necklace of thirty-five Beads, weighing 3 oz. 5 dwts.
Pair of Bracelets, consisting of three rows of fifty-eight Beads, with large Coral Clasp mounted with Diamonds.
Cross, consisting of large disc of Coral in centre, surrounded by eight pear-shaped Corals, the whole mounted with Diamonds; 2 oz. 16 dwts.
Two Brooches of very large pieces of Coral, surrounded by Diamonds.
Pair of round Coral Earrings, girdled with bands of Diamonds.
Coronet or Head-dress of Coral

12. **DE JACOBIS, RINALDO,** 215 St. John Street, Clerkenwell, London, E.C.
Shell Cameos of all sorts; also Ornamental Shells.
Coral in rough state and manufactured.

13. **FRANCATI AND SANTAMARIA,** 65 Hatton Garden, London.
Shells, Carved Cameos, Corals adapted to ornamental purposes, and Shells made into ornaments.

14. **THOMPSON, HENRY JAMES,** Upper Walmer, Kent.
Pair of Alabaster Vases, with Shell Flowers and Insects.
A Round Shade and Stand, Basket Frame Work, with Shell Flowers, &c.
A Round Shade and Basket of Ferns, Flowers, &c.
An Oval Shade and Basket with Group of Flowers and Butterflies, all natural shells.

**Caution.** —THE ONLY ESTABLISHMENT presided over by Messrs. B. BENJAMIN & SONS is known as "ULSTER HOUSE," and is situated

*Between* Nos. 37 & 38, CONDUIT STREET, W.,

the entrance being between the statues of the Dogs, so well known as Messrs. BENJAMIN'S Trade Mark and a feature of Conduit Street.

## MACHINERY IN MOTION.

694*a*. **DAVEY, PAXMAN & CO.**, Engineers, Colchester.
Double Cylinder Horizontal Engine, 350 I.H.P.
Horizontal Compound Engine, 200 I.H.P.
Three Semi-fixed Engines and Boilers, 25 H.P. nominal.
One Semi-portable Engine, 20 H.P.
Group of five Locomotive Boilers.

695. **HALL, J. & E., & CO.**, 23 St. Swithin's Lane, E.C., and Dartford Iron Works, Kent.
Patent Cold-Air Machine, for preservation of fish on board ship and on shore.
A Cold Chamber, on a small scale, for ditto.

696. **BARTON, C. E.**, Providence Works, 56 & 58 Eastgate, Great Grimsby.
Ice Breaker, for steam power.
Ice Breaker, as used by fish merchants.
Ice Breaker, as used on board fishing vessels.
Ice Breaker, as used by fishmongers.

697. **PISTON FREEZING MACHINE AND ICE COMPANY**, 301 & 303 Oxford Street, W.
Ash's Patent Self-feeding Dry Air Cabinet Refrigerators, to be used with rough or block ice, for preserving fish; and another fitted with plate-glass doors. To be seen in action.
One Ash's Filtering Refrigerator; to be seen in action.

698. **CLOWES & SON**, Duke Street, Stamford Street, S.E.
Printing Machinery.

699. **BROOKE, J. W.**, Adrian Works, Lowestoft.
Capstans, set of Capstan Cheeks and Roller, and one Dandy Winch.
Pumps, driven with gas engine.
Two Pumps, used in tanning nets, both driven from one small gas engine.

**MYOCOM FLY GUM.**

A STRING, Straw, or Twig lightly covered with this preparation (non-poisonous), and suspended from the ceiling, will keep any room free from flies, wasps, gnats, &c., &c.
"It is most efficacious and catches even wasps."—*A. Aiwlie.* "The most perfect Fly Catcher he has ever used."—*Admiral Simmerd.* "Really invaluable."—*Capt. Sartfield.* "The first tin caught over 500 flies in half-an-hour."—*T. C. Taylor.* *Mrs. Walton's* servants are delighted with it.
Of all Chemists in **1s.** tins, or by post for **1s. 2d.** of the WHOLESALE PROPRIETORS,
THOS. CHRISTY & Co., 155, Fenchurch St., London.

**ILDING AND SILVERING COMPANY,** 89 Edgware Road, London, W.

Harpoons, Compasses, Telescopes, Barometers, Foghorns, Lamps, Clocks, Reels.

Process in operation of coating all kinds of Metallic Articles used in Fishing or at Sea with Silver, Nickel or Copper, rendering such articles impervious to rust, causing great saving in labour.

**BATEMAN, ALFRED, & CO.,** East Greenwich, London.

Steam Fittings, Safety Valves, and Gauges, for steam ships; Hydraulic Reversing and Steering Gear, Portable Forges, Grindstones, Emery Wheels, Metalized Ship's Blocks, Cranes, and other Machinery, working without lubrication.

A Dinghy.

**HINDLEY, EDWARD,** Bourton, Dorset.

Hoisting and Drawing Engines and Boilers.

6-Horse Power Steam Engine with rope drawing and lifting gear and Boiler.

4-Horse Power Single Cylinder Steam Hoist, with Boiler, on Wheels.

2-Horse Power Hoisting Engine on Wheels.

Double Cylinder 4-in. Force Pump and gear complete, valves accessible without breaking pipe joints.

**OODMAN, ALFRED,** Highgate Foundry, King's Lynn.

Vertical Engine, for capstans and steam winches.

Capstan Engine and Boiler combined.

Steam Winch for hauling Nets, &c.

**USTON, PROCTER & CO.,** Lincoln.

Capstan Engines, with two cylinders, strong vertical boiler, gearing, and improved capstan, and pair of fresh-water tanks; all arranged in position for trawling smack.

Capstan Steam Engine, with two cylinders for hauling up nets; complete with all requisites.

One Improved Capstan Steam Engine suitable for hauling up fishing nets to smack.

Improved Capstan Engine, with two 5 in. × 8 in. cylinders and strong Vertical Boiler, complete with chimney.

Gearing, consisting of Lay-shaft and pedestals, bevel wheel and pinion, vertical shaft bearings and pinion.

*All the Latest Improvements in*

FISHERMEN'S WATERPROOFS,

TO BE HAD ONLY AT

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WORKS—LIMEHOUSE, E.

**RUSTON, PROCTER & CO.**—*continued.*

Improved Capstan, with quadruple hand purchase and arrangement for throwing out of gear.

Wrought-Iron Side Tank for holding fresh water to feed the boiler.

705. **BELL-COLEMAN REFRIGERATING COMPANY,** 45 West Nile Street, Glasgow.

A Gas-driven Refrigerator, for use in fish stores or shops, for preserving fish, &c., at low temperature, or for making ice same purpose. The gas engine and refrigerator are fixed on the same sole-plate.

706. **RANSOME, ALLAN & CO.,** King's Road, Chelsea.

Machines for making Fish Casks, those exhibited being designed for pickle casks of the Scotch type. The set comprises: Machine for jointing staves; Machine for jointing and dowelling heading; Machine for rounding and bevelling heads; Apparatus for heating casks before being trussed; Hydraulic trussing plant, consisting of three-throw pump (lent to Exhibitors by Messrs. A. Smith and Stevens, of James' Works, Battersea); Trussing machine and accumulator with pipes and fittings; Machine for chiming, crozing and howelling casks; special automatic machine for grinding cuttees; 6 HP. vertical steam engine and boiler, with patent governors, &c. (lent to Exhibitors by Messrs. E. R. & F. Turner, St. Peter's Works, Ipswich.)

707. **WILLANS & ROBINSON,** Ferry Works, Thames Ditton, Surrey.

Marine Engines, for fishing or carrying vessels.

Models and Drawings of Steam Trawlers and Carriers.

Steam Capstans and Winches.

Collection of Small Marine Compound Engines for fishing vessels (Willans' Patent), with all working parts enclosed and self-lubricating, and with all bearings in constant thrust, so that the brasses never require setting up.

Steam Capstans and Winches.

Collection of Samples and Models of Robinson's Patent Boat Disengaging Gear, as used in the Royal Navy.


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**Celebrated in Canada, Australia, New Zealand, Cape of Good Hope, Natal, India, and China, as the only reliable makers of OILSKINS that can be packed for shipment, guaranteed to arrive in a marketable condition at their destination.**

**VULCAN IRON WORKS COMPANY,** Scott Street, Hull.
One large Capstan.
Steam Capstan, with Boiler, adapted for use of fresh water only, carried by boats in tanks.
Steam Capstan Engine, with Boiler, adapted for the use of fresh or salt water.
Steam Capstan Boiler and Condenser combined, specially adapted for use on board fishing smacks, for providing fresh water for culinary and boiler purposes.
Model of a Steam Trawler.
Photographs, &c., of Marine Engines, Steam Trawlers, Steam Capstans, and Fishing gear.

**BECK, J. & CO.,** 130 Great Suffolk Street, Southwark, S.E.
Valves, Pumps, Hose, &c.
Fog Horn.

**KEYMER, H. J. C.,** The Fisheries' Iron Works, Great Yarmouth.
Capstan Engines.
Hand Capstan.
Deck Brush Boring Machine.
Model Steam Fishing Vessel.
Model Fishing Boat and Off-Shore Boat, fitted with steam.
Keymer's Patent Combined Steam Engine and Capstan, Horizontal Type.
Keymer's Patent Combined Steam Engine and Capstan, Vertical Type.
Steam Engines and Arrangement for driving Capstans, Horizontal Type, Old Style.
Steam Engines and Arrangement for driving Capstans, Vertical Type, Old Style.
Improved Double Purchase, Covered Top Capstan, 3 handles, with Keymer's Ball Bearings.
Improved Treble Purchase, Double Speed, Covered Top, 3-Handled Capstan, on Keymer's Patent Ball Bearings.
New Style Iron Bar Capstan for Steam, on Ball Bearings.
Lighter and smaller Covered Top Double Purchase Hand Capstan, on Ball Bearings.
Messrs. De Caux and Keymer's Power Saving Patent Differential Hand Capstan.
Keymer's Patent 6-Spindle Deck Brush Boring Machine.

**FOR STEAM JOINTS.**
**PERRONCEL'S Patent Plastic Compound Sheet (called Leather Felt) is employed by the French Government, the Principal Railways, and Transatlantic Steamboat Companies, &c. Unequalled for immediate application, without waste to any steam joints, and equal to the severest tests.**
**ANDERSON, ABBOTT, AND ANDERSON,**
*INDIA-RUBBER MANUFACTURERS.*
**7, QUEEN VICTORIA STREET, E.C., LONDON, ENGLAND.**

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Inside Lining of Refrigerators.

712. **ROSE, DOWNS & THOMPSON,** Old Foundry, Hull, and Kingston Works, Grimsby.
Collection of Steam Machinery, used in trawl fishing.
Kingston Capstan Engine with two 5-inch cylinders.
Kingston Capstan Engine with two 4-inch cylinders.
Kingston Winch for Wire Trawl Warp.
Improved Capstan for hand or steam power.
Collection of Improved Appliances for trawling vessels.

713. **HASLAM FOUNDRY AND ENGINEERING COMPANY, Limited,** Union Foundry, Derby.
Refrigerating Machine for steam carrier.
Refrigerator for fishing smack, with steam capstan, and connected to a freezing chamber or cold stores.

714. **DAVIS & CO.,** 24 Moorgate Street, London, E.C.
Capstan, Windlass, and Steering Gear.

715. **CLARK, BUNNETT & CO.,** 150 Rathbone Place, London, W.
Hydraulic Dredger.

716. **SIEBE, GORMAN & CO.,** 187 Westminster Bridge Road, London, and Neptune Works, Mason Street, Lambeth.
Patent Universal Cold-Air Machine, for preservation of fish, &c.; suitable for small steamers, &c.

717. **MITCHELL & SON,** Kirkcaldy, N.B.
Windlasses, for hauling fishing nets and gear, hoisting masts, &c.

718. **ABBOTT, J., & CO.,** Newark-on-Trent.
Machinery.

719. **SHIELDS, JOHN, & CO.,** Wallace Works, Perth.
Apparatus for spreading oil on troubled water.

720. **SIDDELEY & CO.,** 14 Upper William Street, Liverpool.
A Complete Refrigerating Apparatus, for fishing vessels or fish carriers: comprising a freezing machine and necessary fittings for the hold, to keep same at low temperature.

BUNNETT'S PATENT HYDRAULIC HOISTS.
CLARK'S PATENT SELF-GRIPPING CRABS.
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*RATHBONE PLACE, OXFORD STREET, LONDON.*
**Constructors of every description of Corrugated Iron Houses, Constructional Ironwork, &c.**

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American Refrigerator, for the preservation of fish, food, &c., perfectly dry cold air.

**IESTMAN BROS.**, 52 Queen Victoria Street, and Hull.
Steam Dredger (in grounds).

**ARK, BUNNETT & CO.**, Rathbone Place, London, W.
Hydraulic Lift.

**VANSEA WAGGON COMPANY**, Swansea.
Refrigerating Railway Waggon for the conveyance of fish.

**IOMAS, E. C. G.**, National Club, Whitehall, London.
Marine Motor for Electric Light on Vessel or Buoy. By an accumulator the work of 24 hours is stored for use at night. Connection is made and broken automatically at sunset and dawn.
Model of Harbour for fishery purposes, consisting of a floating breakwater or outer harbour, as an anchorage at all times of tide and weather; an inner harbour with wharves, the sea walls so placed as to form a well defined entrance, and constructed in such a form as to admit additional wave water, and thus make the outgoing tide completely overpower the incoming one in its action on the bar at the mouth of any river or creek. This action, aided by the automatic submarine dredge permanently sweeps away the bar and prevents it from reforming.
Submarine self-acting Dredge for clearing away bar from river mouths. Every outgoing tide propels the dredge, and carries away the silt or sand.
Permanent self-burying Anchor. Unlike ordinary anchors, as it is intended never to be heaved again, but to take root and become a fixture, for use with light vessels, beacons, floating breakwaters.
Greenway Buoy, half size. A row of these buoys form the breakwater. These detached portions of the breakwater cleave the waves, and turn the cleft portions against each other, thus causing them to expend their force innocuously, and creating a safe anchorage behind. Each buoy creates its own electric light and carries a fog bell.
Model of Greenway Breakwater as a harbour of refuge on the coast. Purely a shelter harbour for use during storm, or

BY SPECIAL ROYAL APPOINTMENT.

**DAY, SON, & HEWITT'S**
**RIGINAL" STOCKBREEDER'S MEDICINE CHESTS.**
*TAINING THE "CHEMICAL EXTRACT" "GASEOUS FLUID," "RED DRENCH," &c.*
**Prices: £2 16s. 6d. and £6 6s. Carriage paid.**
22, DORSET STREET, *BAKER STREET*, LONDON, W.

**THOMAS, E. C. G.**—*continued.*

when low tide prevents ingress to a neighbouring port, may be constructed in three months, at small cost, and affording any depth of water the largest vessel can require. If repeated every fifty miles along the coast it would almost prevent shipwreck, and save one thousand lives a year.

Model of Greenway Breakwater as a harbour of refuge on the Dogger Bank, or other fishing resort, where fishing boats might have shelter for a few hours at any time without losing days by leaving the banks for the coast and its fatal high tide harbours; where might lie permantly a store vessel from which smacks might temporarily refit; and which would form a port of call for the steamers sent out by smack owners to collect the fish.

Model of Greenway Breakwater as supplementing existing harbour works, protecting the existing stone piers, and thus obviating the necessity for frequent repairs as at Wick (where the sea overturned a massive coping of 800 tons in one block), Plymouth, &c., and creating an additional outer anchorage.

Model of Greenway Breakwater sheltering a lighthouse, and giving access to them at all times. Thus preventing the chance of the starvation of the men and extinction of the lights as almost occurred recently at three of the most important lighthouses—Calf, Wolf, and Eddystone.

Model of Greenway Breakwater protecting a coast threatened by marine encroachment, at far less cost and more permanently than a continuous sea-wall often needing repair.

726. **TURNER GAS ENGINE COMPANY,** St. Albans.
Vertical Gas Engine for driving steam fishing smacks.

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## PREFACE TO CLASS IV.

### Fish-Culture.

Fish-culture in the last quarter of a century has developed aims which remove it very far from the fish-culture of the past.

The object of modern pisciculture is to preserve the balance of fish life against the disturbing agencies of modern civilization, by affording, through close and accurate study, a safe basis for legislative enactments, and by restoring the already depopulated waters to more than their pristine wealth.

Modern fish-culture embraces alike sea and land; ancient fish-culture, with the exception of a few brackish lagoons, comprised freshwater only.

If however Diodorus Siculus is to be trusted, fish-culture flourished 3400 years ago, on a commercial scale which rivals any modern industry, as he mentions an artificial lake constructed by Moeris, where the revenue derived from the fishing

exceeded a talent a day; and the fish increased so fast that the preparations for salting were insufficient.

Passing to China and Japan, fish-culture has long been carried on, but I am not aware that it extends beyond the collection and sale of spawn, and the artificial feeding of young fry, although the telescope fish has undoubtedly become a permanent variety through artificial selection.

Roman fish culture consisted in constructing stews, more for the gratification of luxury than for increasing the food of the country.

In medieval times the institution of the monastries again encouraged fish-culture; and it is probable we owe to the monks our grayling and our coregonus, and very likely our pike also; but in their time the great necessity for fish-culture had not arisen. The rivers were still unpolluted and the seas undisturbed.

That the bays, estuaries, and sheltered parts of the coast may in the immediate future be systematically cropped with crabs and lobsters, and with oysters and edible molluscæ—that smelts may swarm in our estuaries, and the deep-sea cod be artificially increased—is part of the object of modern pisciculture.

In fresh water the important problem of the culture of the salmonidæ has within the last few years been solved. The discovery of Pinchon, in the fourteenth century, the work of Jacobi in the eighteenth, and again, the observations of Gehen and Remy in the latter part of the first half of the present century, paved the way for the establshment of Huningue; while M. Veraskie's notebook in the autumn of 1856 for ever set at rest all difficulties as to artificial impregnation, although probably fifteen years elapsed before his dry method was adopted out of Russia; and to Mr. George Sheppard Page the credit is due of making known M. Veraskie's experiments in America. Results on that continent may perhaps best be expressed by quoting a letter from Professor Spencer Baird, Commissioner of Fish and Fisheries, Washington, to the Commissioner of Fisheries of Canada. "In the Sacramento River we are absolutely certain of our ground, having brought "up the supply of salmon to more than its pristine condition of abundance, by "planting about two millions of young fish every year. The catch there has "increased in five years from five million (5,000,000) pounds to fifteen million "(15,000,000) pounds; and in 1881 there was more fish than could be utilized in "all the canning establishments on the river."

One of the most important points in the study of fish-culture is the selection of the most suitable fish for the purpose in view, and the acclimatisation of new species, to be permanently beneficial, requires great knowledge and care.

The cultivation of the food of fishes in fresh water, and its study in salt, will we hope receive great stimulus from this Exhibition. In both branches there is a rich harvest to be gathered. The migrations of many species of sea fish depending principally—and the quantities of fresh water fish a given space will carry depending entirely—on the feeding. Salmon depend on their spawning rivers for quantity, and on their sea-feeding for size and quality. Oysters frequently thrive and fatten best under conditions unfavourable to their reproduction, hence the kindred problems of increasing the supply of salmon and of oysters have something in common, and in future will be largely dependent on artificial culture for their production, and on careful legislation for their increase and development.

Salmon ladders will always continue necessary aids to sport, but the rapid strides with which artificial breeding is advancing will prevent their insufficiency telling much longer on our food supply.

France, already at the head of oyster culture, is again moving in the matter of pisciculture; and M. Chabot-Karlin, in the Bulletin Ministère de l'Agriculture, 1882, reports on the project of forming sixteen chairs of pisciculture throughout France, and in the first bulletin for 1883 he reports that in Belgium the government has, by the creation of a vast piscicultural establishment, commenced the restocking of the Meuse Supérioreure—that in the grand duchy of Luxemburg the best practical results in Europe have been obtained—that in Germany success has been obtained by official encouragement to private societies, of which that of Metz offers a valuable model—that Holland, by a system of prizes for stocking waters, has produced the best results, and, through its concessions of the public domain, has carried oyster culture to the highest point in Europe. Of the countries not mentioned in the report Norway and Sweden are fully alive to the value of pisciculture; Austria also possesses many establishments. Russia has long given much study to fish-culture: the inspector of fisheries in Findland, Professor Malmgren, has just issued an important report.

Salmonidæ have been successfully introduced into India, first by Professor Day, and to the Antipodes by Messrs. Francis Francis and Youl.

It requires only the collection and distribution of the knowledge of the world's work in fish-culture—as we hope it will be collected and distributed through this Exhibition—to make an acre of water more valuable than an acre of land, and the toilers of the sea reap many fold their present harvest.

J. R. G. MAITLAND.

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## AQUARIA.

IT was not until the Executive Committee of the International Fisheries Exhibition became aware of the immense size which it was rapidly attaining, and of the vast national, not to speak of international importance with which the undertaking had become invested, that the idea of erecting a system of sea and fresh-water aquaria was practically taken into consideration. Nor was it after either the first or second anxious discussion that the Committee felt justified in incurring the large outlay and truly gigantic amount of labour, both theoretical and practical, which the task of building even a small aquarium under favourable conditions necessitates. A very little thought will suffice to realize how arduous and varied were the duties which by such a resolution the Executive Committee undertook. Their first act was to select a Sub-Committee formed of those gentlemen who were not only eminently qualified and capable, but also willing to plan and execute upon the best system by which the numerous difficulties caused by an unsuitable locality could be most easily combated. The list of this Committee included the following well-known names, who have laboured hard since October last to carry out the work which now speaks for itself:—Sir James Ramsay Gibson Maitland, Bart., T. J. Mann, Esq., Col. Stuart Wortley, A. G. Jardine, Esq., Francis Day, Esq., W. Fell Woods, Esq., Oldham Chambers, Esq., J. T. Carrington, Esq.

After the closest inspection of the portions of the gardens available for the purpose, the Committee ultimately decided upon the present position, known generally as the West Arcade, for several weighty reasons, such as solidity of foundation, existence of a heavy concrete roof, and the immunity conferred upon it by its position from the rays of a summer sun, which would have acted seriously on the temperature of the water, while the presence of spacious cellarage at the

southern end afforded the means of procuring a large reservoir for the storage of the necessary sea water.

Although the period for which it is proposed to keep the Exhibition open for is only six months, yet the Committee have had all the work in connection with the tanks executed in the most enduring materials, so that there may not be any chance of those small leaks which have proved such deep sources of trouble in nearly every existing aquarium. In carrying out the work the Committee have had the benefit of the great experience of Mr. H. C. Norman, of the firm of Messrs. Leete, Edwards and Norman, of Euston Road, in conjunction with whom he has superintended the fitting up of the vulcanite circulation system to the principal existing aquaria. The brickwork is entirely of the best brick fixed in cement, and was set under the personal supervision of Mr. Wilson Bennison, who, in connection with the late Major-General Scott, C.B., has most efficiently carried out the arduous task of erecting the Exhibition buildings.

In order to meet the demands of numerous exhibitors, and to enable them to make the Aquarium thoroughly representative, the Committee found that it would be necessary to build nineteen tanks for sea and fresh water, and twenty smaller table tanks for sea water alone. As the appearance of these tanks when merely finished off with asphalte and slate respectively appeared to the Committee to be somewhat unattractive, they determined to face them with rock-work, and found in Mr. Pulham, of Broxbourne, Hertfordshire, a talented and willing contractor, who, in spite of the difficulties which are caused by the use of lime in any active form, has executed his work with much taste and skill at a merely nominal cost. The water for the sea-water tanks has been obtained direct from Brighton, and has been supplied by Messrs. Hudson & Co., of Pimlico, whose extensive plant, employed for the sea-water supply to the Crystal Palace and Westminster Aquarium, obviates the danger of any impurities being brought into contact with the sea-water in transit. The total bulk of water in circulation through the ten large and twenty small sea-water tanks and reservoirs is very great, and the entirety was conveyed from Brighton to South Kensington at a fixed rate of 5000 gallons per day. The remaining nine large tanks are fresh-water tanks, and to prevent the fish being exposed to the variations of quality and temperature of the ordinary West Middlesex Water Company's supply, the Committee have availed themselves of the kind offer of Messrs. Atkins & Co., Sanitary Engineers, of Bouverie Street, Fleet Street, to place at their disposal one of their large water-softening and filtering apparatus, which will, as the fresh-water tanks are provided with underneath reservoirs, allow of the same water being kept continuously in circulation, and will of itself prove a great saving in expense, besides benefiting the fish.

The question of stocking an aquarium being one of great difficulty and also expense, Lord Walsingham, who has presented 1000 freshwater fish of various kinds, the Duke of Bedford several species of carp, the Marquis of Exeter trout and black bass, the Duke of Portland trout, Sir James G. Maitland trout, and numerous others, have by their generous gifts tended very greatly to mitigate the arduous task of the Stocking Committee, who have yet had to use every endeavour to arrange for an adequate amount of seawater fish and crustacea. In order to procure an independent supply of the former, the Committee engaged the services of a smack-owner to trawl for them in the Channel for three weeks; and as the managers of the Brighton Aquarium kindly consented to receive and store the takes of fish in their spare tanks, so as to give them a break in the voyage from Brighton to the Exhibition, the Committee have been

enabled to stock their tanks with, so to speak, partially educated fish. As regards crustacea, the Committee are indebted to Messrs. Poland Brothers, of Billingsgate, who have supplied them with a very fine exhibit of lobster, crabs and crayfish; Messrs. Sayer and Co., of Thames Street, and Messrs. Lynn and Gibson, who display an appetising show of shrimps, prawns, and other crustacea.

Another, and perhaps almost the most attractive, branch of the Aquaria is that which contains the anemones, for the finest specimens of which the Committee are again indebted to the Directors of the Brighton Aquarium, who have given every assistance to procure a thorough and handsome collection. It will be well, perhaps, for those visitors who take any interest beyond mere curiosity in an aquarium to try and realise for a few moments the seemingly overwhelming difficulties which appear to crop up on all sides to those who undertake the formation of one. So numerous are the questions which have individually to receive the deepest discussion, that it is quite impossible to consider them in a short preface; but it may be as well to mention some of the few principal ones. The first question is the quantity, quality, and direction of the supply of light, which, if not of the most perfect and direct kind, will entirely prevent the finest aquarium from ever becoming a success. Second in importance are the questions of foundation and drainage, as the slightest error in either of these causes not only leaks in masonry, but signs the death-warrant of the costly plate glasses. Next the temperature and quality of the water to be used give a vast amount of anxiety, and when, in spite of all difficulties, the naturalist has erected for himself an aquarium, and the tanks appear to be in the highest degree satisfactory, he has the disappointment of learning that the light which he has been so assiduously arranging for the benefit of the public is a deadly enemy to the fish. These are merely the larger troubles, and as such sufficient to prove to the visitors' mind the public thanks which are due on all sides to those who lend all their science, knowledge, and energy for the public good.

H. W. T.

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## Division XXXV.

## FISH CULTURE.

**Models or drawings of fish hatching, breeding and rearing establishments, including oyster and other shellfish grounds; and all apparatus and implements connected with the same and for transporting fish and fish ova. Food for fry.**

## Division XXXVI.

**Representations illustrative of the development and progressive growth of fish.**

727. **RUSS, PERCY.**
Oysters.

728. **LONDON OYSTER CULTIVATING CO., Limited, THE,**
14 Devonshire Square, London, E.C.
*Oysters.* Raft for Cultivating Oysters.

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Total amount of New Assurance written during the past Sixteen years is larger than that transacted by any other Company. Over **£14,000,000** have been paid to Policy-holders in Twenty-three years.

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**ANHYDROUS.**

Made of leather prepared by the process approved by the Admiralty for the Arctic Expedition.

Dry, Warm, and Comfortable in Wear.

**27/- per Pair.**

I can strongly recommend the "K" boot, which is advertised in "The Field." I have had a pair a month in all sorts of slush, and find them thoroughly waterproof, and most comfortable to walk in; they are about half the price a first-class London maker charges and quite as good.—S. R. Berwick-on-Tweed.—*Field, Dec. 11th*, 1880.

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NOTTINGHAM.—Thos. W. Robinson, 2, Long Row.
OXFORD—Lillington's, 48, Cornmarket St.
SALISBURY.—J. D. Courtenay, 17, High St.
SHEFFIELD.—Greaves & Son, 157, West St.
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730. **GRESSY & EZANNO,** Carnac, Morbihan.
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731. **LE ROUX, DR.,** Les Sables d'Olorne, Vendee.
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732. **CORNILLEAU, L. MONS.,** La Triniter sur Mer, Morbihan.
Oysters.

733. **LAMARZETTE DE G.,** Vannes, Morbihan.
Oysters.

734. **POZZY, MONS.,** Sarzean Morbihan.
Oysters.

735. **MARTIN, ALPHONSE,** Kerrgurionne, Morbihan.
Oysters.

736. **NOUGÈ, HENRI,** Marennes.
Oysters.

737. **EDAN ET JARDIN,** Auray, Morbihan,
Oysters.

738. **ATKINS WATER SOFTENING CO.,** Bouverie Street, Strand.
Filtering Apparatus.

739. **PIOLANT, VICOMTE DE,** Villa Briançon par Loubise.
Oysters.

740. **GRAND, SIMON,** Marennes, France.
Oysters.

741. **WHITSTABLE COMPANY OF FREE FISHERIES AND DREDGERS,** in the County of Kent, known as "*Whitstable Oyster Company,*" Thomas G. Browning, Clerk, Whitstable.
Samples of Oysters, Living Spat (shown microscopically) and Brood. *Facsimile* of natural Oyster Ground, with boring molluscs and other enemies; algæ, sponges, zoophytes, &c. Samples of soil.
Collection of Oyter Shells.

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**HITSTABLE COMPANY OF FREE FISHERIES AND DREDGERS**—*continued.*

Collection of preserved Zoophytes found at Whitstable.
Collection showing *Teredo navalis* and its ravages.
Act of Incorporation, 1793, and Seal of the Company.

**ILK, W. T.,** for the Marquess of Exeter, Burghleigh Park, Stamford.
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**ANDREWS, THOMAS,** Westgate House, Guildford.
Yearling Trout.

**EDINBURGH MUSEUM OF SCIENCE AND ART,** Edinburgh, Prof. T. C. Archer, Director.
Model of Salmon Ladder (in case), designed by Messrs. Leslie & Son, Civil Engineers, Edinburgh.
3 Models of Salmon Ladders, designed by Messrs. Leslie & Son, Civil Engineers, Edinburgh (in case).
Model of Stake Net, made by Mr. Alexander Speedie, Perth.
The Muszynski Apparatus for transporting the fry of fish; by this apparatus 10,000 fry of Coregonus Baeri were safely transferred from St. Petersburg to Edinburgh, and a Collection of Fishing Appliances used by the Faröe Island Fishermen.

4a. **CAPEL, CHARLES CECIL,** Cray Fishery, Foots Cray, Kent.
Yearling Trout.

5. **CHAMBERS, W. OLDHAM,** Lowestoft.
Yearling Trout.

6. **THOMAS, J. J., & CO.,** 87 Queen Victoria Street; 285 & 362 Edgware Road, London, W.
Galvanized Wire Lattice diamond mesh in roll, used in oyster culture.

48. **CURTIN, FERGUS,** Mucknish Castle, Burren Oranmore, Ireland.
An Oyster Lifter, Invented by Exhibitor.
Oysters, Red Bank, Burren.
Scollops, and other Shellfish

Stop at **BAKER STREET STATION** for

**MADAME TUSSAUD & SONS' EXHIBITION.**

**Admission 1s. Extra Rooms, 6d. Open from 10 till 10.**

## Division XXXVII.

### Models and drawings of fish passes and fish ladders. Scientific investigations.

749. **CAIL, RICHARD,** Newcastle-on Tyne.
Cail's Lock Swimming Salmon Pass.
This system of pass enables the heaviest spawn-laden salmon to surmount any obstacle in rivers, such as natural falls, dams or weirs of any height, even to 100 feet or more, by swimming through it in unbroken water from the lower to the upper water, without fatigue, exposure, or having to leap. The quantity of water to work this pass is small, self-acting, and regulated exactly to suit itself to any height of the water in the river in freshes or floods. The velocity of the water does not increase as it descends, and in each lock is nearly quiescent and purls about, imposing no exertion on the fish, and as fish and water are the same specific gravity, they can ascend 100 feet easier than a man can ascend the same height by a stair.

750. **SILK, W. T.,** for the Marquis of Exeter, Burghley Park, Stamford.
Model of Fish Breeding and Rearing Establishment.
Apparatus for Hatching Salmonidæ.
Apparatus for Rearing Salmonidæ.
Apparatus used in transporting Black Bass from U.S. America, with Pump.
Tank for conveying Young of Salmonidæ long distances, with Electric Pump attached.
Apparatus for carrying Ova of Salmonidæ.
Hatching Apparatus for Cod, Soles, Turbot, Herring, &c.
Hatching Apparatus for Pike, Roach, Perch, and Tench.
Two Salmon Ladders, 1 Jumping Ladder, 1 Swimming Ladder.
Food for Fry.
Model of Fish Hatching.
Fish Passes.

751. **PORTLAND, HIS GRACE THE DUKE OF,** Welbeck Abbey, Worksop.
Model of Fish Hatching House and appliances for ditto.
Model Fish Ladder and Photograph.

WM. WOOLLAMS & CO.,
ORIGINAL MANUFACTURERS OF
ARTISTIC WALL PAPERS,
FREE FROM ARSENIC.
Sole Address: 110, High St., Manchester Sq., London, W.

**CHAMBERS, W. OLDHAM,** Lowestoft.

Model and Plan of Fish Culture Establishment, for 100,000 Salmonidæ, combining Efficiency with Economy.

Model and Plan of Fish Culture Establishment, for 300,000 Salmonidæ, combining Efficiency with Economy.

Model of a series of Fish Ponds for Fresh Water Fishes. In this and the two previous models every pond is entirely independent of the other, and under entire control and management.

Description of the way in which Fish Ponds can be constructed, and guidance for their management.

Hatching Apparatus for Salmonidæ.

Hatching Apparatus for Salmonidæ, smaller size.

Hatching Apparatus for Coarse Fish.

Vase for Hatching deep-sea floating Eggs, such as the Cod.

Box for Hatching deep-sea adhesive Eggs, such as the Herring.

Specimens of twenty-five live yearling Trout.

Vase for Rearing Salmonidæ Fry.

Vase for Rearing Salmonidæ Fry, on pedestal.

Specimens of young Trout in spirits, showing progressive growth.

**NORFOLK AND SUFFOLK FISH ACCLIMATIZATION SOCIETY,** London Road, Lowestoft.

Brace of Trout.

**STUART & CO.,** 8 Thomas Street, Edinburgh.

Patent Granolithic Model of Salmon Pass or Ladder at Morphie, on the North Esk, Forfarshire. Depth of pass, 20 inches; breadth at top, 5 feet, gradually widening out until it is nearly twice that width at bottom; length of pass, 70 feet; scale, $\frac{3}{8}$ inch to 1 foot.

Patent Granolithic Model of Salmon Ladder at Deanston, on the Teith, Perthshire. Length of salmon ladder, 250 feet, gradient 1 in 27; width of ladder at bottom, 40 feet; height of side wall at top, 4 feet; height of side wall at bottom, $12\frac{1}{2}$ feet; cross beams 1 foot deep and 12 feet apart (except the three upper spaces, which are respectively 8, 9, and 10 feet apart. Total width of weir at sill, 248 feet. Scale $\frac{3}{8}$ inch to 1 foot.

THORLEY'S FOOD FOR CATTLE.

*(ESTABLISHED OVER 30 YEARS.)*

Thorley's Food has acquired and still retains its world-wide reputation as being the best Cattle Food in the world. As a **Tonic** or **Stimulant** the invention stands **alone.** 1st Prize Medals Sydney, Melbourne, and other Exhibitions. Sold in all parts of the world.

Thorley's Condiment for Calves, Horses, Sheep, Pigs, &c., &c.

**JOSEPH THORLEY,**

**THORNHILL BRIDGE, KING'S CROSS, LONDON.**

755 **MAITLAND, SIR JAMES RAMSAY-GIBSON-, BART.,** of Barnton.
Model of Salmon Hatching House at Howietoun.
Model of Piscicultural Establishment at Howietoun.

Implements and Utensils used therein, viz., hatching and rearing trays, cases for transport and export of ova, tanks for carrying Trout and Fry with automatic aeration of the water, "feeding spoons," grilles, ova extractors, safety screens, syphons, spawning dishes, thermometers, &c.

756. **BOLTON.**
Oysters.

756*a*. **FISHERIES PRESERVATION ASSOCIATION,** per H. A. Kinloch, Secretary, 17 Seymour Street, Portman Square, W.
Models of Salmon Nets.
Models of Weirs, with fish-passes.
Models of Putchers, &c.

757. **KESSELL & SON,** 11 Southwark Street, Borough, London, S.E.
4 Fountain Aquaria with Fish, &c. No. 1 size, but in various decorations. Live Gold and other Fish.
4 Fountain Aquaria. No. 2 size in variety of decoration. Fitted with Live Gold and other Fish.
2 Fountain Aquaria, with Ferns or Flower Stands combination.
2 Oblong Aquaria on Stands (Ornamental), with living Fish.
2 Round Aquaria on Ornamental Stands, with Fish, &c.

758. **SPRATTS' PATENT,** Henry Street, Bermondsey, London, S.E.
Food for Rearing Young Fry and Feeding Adult Fish. Entirely obviates the great trouble experienced by fish-rearers in preparing food, economises expense and minimises the tendency to that destructive disease, Mould.
Food for Coarse Fish.

759. **CLARK, JOHN,** 17 Royal Exchange Square, Glasgow.
Model of Williamson's Fish Hatching Trough, fitted with a wire cloth basket, similar to those used in the Salmon Hatching Establishment, near Cloud River, California.
Also a set of three Steel Wire Grilles, new style, which can be made at a moderate price.

**LINCRUSTA - WALTON.**
*(The Celebrated Sunbury Wall Decoration.)*
EIGHT PRIZE MEDALS.
HIGHEST AWARD WHEREVER EXHIBITED.
**Head Office and Works: SUNBURY-ON-THAMES.**
*Show Rooms—9, BERNERS ST., LONDON, W.; and at CRYSTAL PALACE*
SOLD BY ALL FIRST-CLASS UPHOLSTERERS AND DECORATORS IN THE UNITED KINGDOM.
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**BAPTY, SAMUEL LEE,** 65 Blackheath Road, Greenwich, Kent.
One set of Littlewood's porous terracotta Fish Hatching and Rearing Apparatus, consisting of six terra-cotta pans arranged on stage, the lower ones taking the overflow water from the top.
Littlewood's Improved Tank Aquarium on stand. The improvement consists in the arrangement of the overflow, which is taken from the *bottom*, thus retaining the freshest and most highly oxygenated water near the top, and also clearing away the excrements, &c., which collect at the bottom.

**FOLEY, R.,** Lismore, Ireland.
Model of a Salmon Weir.
Maps and Plans.
Model of Clondulane Fish Pass.
Model of Fernsoy Fish Pass.

**RAGLAN, W.,** 15 Mornington Road, New Cross.
New designs for Aquarium.

**PHILLIPPS.**
Oysters.

**ARMISTEAD, JOSEPH J.**
Oysters.

**CORBIGNY, H., DE,** Auray, Morbihan.
Oysters.

**RICHERIE, G. G., DE LA,** 4 Rue Cale Ory, L'Orient.
Oysters.

**SEASALTER & HAM OYSTER CO.,** Whitstable, Kent; and 11 Lower Thames Street, London.
Model of "The Company's" Oyster Breeding and Rearing Establishment at South Hayling, Hampshire.
Spat Collectors.
Models of Apparatus for Rearing and Protecting Young Oysters.
Model of portion of Oyster Ground at Whitstable, with Boats, &c., showing mode of fishing, &c.
Specimens shewing progressive growth of Oysters, &c.

**WHITSTABLE OYSTER COMPANY.**
Oysters.

WATERPROOFS FOR BOYS,
In Tweed, Paramatta, and other Materials.
WATERPROOF LEGGINGS & SCHOOL SATCHELS.
**ANDERSON, ABBOTT, & ANDERSON,**
37, Queen Victoria St., London, E.C.

768*a*. **PELARGIE, V., MONS.**, Rochefort S/mer.
Oysters.

769. **SOFTLEY, R. T.**, Central Works, Row 63½ King Street, Great Yarmouth.
Tanks used in Fish-Hatching Establishments.

770. **SMITH, W. A.**,
Oysters.

771. **AUSTEN, A.**
Oysters.

772. **OYSTER MERCHANTS' COMPANY.**
Oysters.

773. **WISEMAN, FREDERICK**, Paglesham, Rochford, Essex.
Living and dead specimens of Native Oysters, Oyster Brood and Dog Whelks, &c.

774. **WOODS, W. FELL**, Gorse House, Forest Hill, S.E.
Implements and Apparatus used in oyster culture.
Specimens illustrative of the development and growth of oysters bred artificially, &c.

775. **DILNOT, G.**, Hayling North, Havant, Hants.
Economical Appliances for Oyster Culture.
Tiles, boards, and canvas spat collectors.
Canvas Rearing Trays for first stages of growth after detachment.
Trays for ultimate growth.
Pair of oyster lifters Brood Harrow.

776. **ERNE FISHERIES**, Ballyshannon Co., Donegal, Ireland.
Model of Fish Hatching House, with Troughs complete.
Model of Pond for retaining Salmon for Spawning purposes. This is placed at end of fish house.

777. **GRAND, SIMON.**
Oysters.

778. **SMALL & SONS, W. T.**, 37 Brecknock Road, 48 King's Road, and 100 Newington Green Road, London, N. Patentees and Manufacturers of Hydraulic Apparatus for causing a running stream and cleansing Aquariums.
Ponds with Hatching Box and Beetle Glasses.
Globes for Fish, &c.

INCUBATORS
FOR
HATCHING OUT
CHICKENS
DURING
ALL THE YEAR.

Patronised by H.R.H. THE PRINCE OF WALES.

The Eggs placed in one of these Incubators are turned night and morning and maintained in a regular temperature of 104°. Fresh air and moisture are provided, and the Chickens hatch out strong and healthy by the 21st day. Prices range from **30s.** upwards. The larger patterns are made self-heating and self-regulating, and do not require more than **5** minutes' attention night and morning.
Guide Books to the System, **1s.** each; by post, **1s. 2d.**

THOS. CHRISTY & CO., 155, FENCHURCH ST., LONDON.

**BERNEY, GEORGE DUCKETT,** Morton Hall, Norwich.

Model, one-third size, of tub, with diaphragm and perforated zinc plate for transporting live fish; internal parts shown which prevents fish from being bruised or choked with dirt.

Model of Improved Carboy for transporting live fish.

Model of Box suspended over water, for feeding fish with maggots, so that they may not be dried up by the sun.

**ING, GEORGE HOADLEY,** Sea Horse House, 165, Great Portland Street.

Rustic Fish Hatching Apparatus, invented by G. H. King in 1863, and supplied to the South Kensington, Derby, and Liverpool Museums.

**RNE FISHERIES.**

Oysters.

**OUNG, ARCHIBALD,** Advocate, Inspector of the Salmon Fisheries of Scotland, 22 Royal Circus, Edinburgh.

One of the cheapest and most successful fish-passes ever constructed in Scotland. It cost only £100, and was designed, not by an engineer, but by a practical fisherman, known in the North Esk Districts as "Skipper" Scott.

**IANN, T. J.,** The Grange, Bishop Stortford, Herts.

Models of a Fish Breeding and Rearing Establishment for 100,000 Salmonidæ.

**RMISTEAD, JOSEPH JOHN,** Solway Fishery, Dumfries, N.B.

Model of Hatching Establishment.

Hatching Apparatus.

Apparatus for transport of Fish and Ova.

Sundry Apparatus connected with Fish Culture.

Food for Fry.

Sundry Piscicultural Appliances.

Water Plants in relation to Fish.

Set of 8 glass tubes showing young Salmon in ovum and weekly growth after hatching out from the 1st to 42nd day.

Illustrations of the development, &c., of Fish.

EDWARD SMITH'S NEW CHORAL SINGING TOP is, without doubt, the most wonderful top ever invented. It plays most beautiful chords and harmonies, which can be instantly changed without stopping or in any way impeding the motion of the top. Children are amused with it for hours. It is of most simple construction. Price, in box, 1s. 6d., post free. Grand Illustrated Catalogue of Toys and Games sent post free to any part of the world, 4 stamps.
EDWARD SMITH, The City Toy Shop, 3, Cheapside, E.C.

NO MORE SCISSORS TO GRIND, OH!
EDWARD SMITH'S
NEW SCISSOR SHARPENER, Regd.
Is the wonder of the age. It will put a better edge on a pair of scissors in ten seconds than any grinder can in ten minutes, and it will never wear out; the directions are most simple; it does not wear away the scissors in the least; no household should be without one. My Scissor sharpener will be found not only useful but a perfect boon. *In neat box, with full directions, Post Free*, 2/3.
EDWARD SMITH, The City Toy Shop, 3, Cheapside, E.C.

784*a*. **HORE, J. P.**, 40 and 41 Bloomsbury Street, Bedford Square, London, W.C.; and Salmon and Trout Fishery, Llyn Peris, Llanberis, North Wales.

Models and Drawings of Salmon and Trout Hatchery and Incubators, at Llyn Peris (Emasculated) Salmon Fishery, near Llanberis, North Wales.

Specimens of Emasculated Salmon, bred from the ova, and exclusively reared in isolated fresh-water lakes.

Apparatus and Implements connected with the same.

Articles used in the transmitting Fish Ova, Fry, and Fish.

785. **MALCOLM.**

Oysters.

786. **ANDREWS, THOMAS,** Westgate House, Guildford.

Tank, 12 × 4 ft., containing large Trout, 3 years old and upwards.

Tank, 9 ft. × 4 ft., containing food for Trout.

Tanks, 9 ft. × 4 ft., containing Yearling fish.

Hatching and Rearing Trough, 9 ft. × 4 ft.

Hatching Trough, 9 ft. × 4 ft., to bring on to feeding point 120,000 Salmonidæ.

Rearing Trough, 9 ft. × 4 ft., containing yearling fish.

Rearing Trough, 9 ft. × 4 ft., containing 2-year old hybrids.

Hatching Trough, 3 ft. × 1 ft., to bring on to hatching point 100,000 ova.

Hatching and Rearing Trough, 3 ft. × 1 ft., containing Fry and natural food for Trout.

787. **CAPEL, CHARLES CECIL,** Cray Fishery, Foots Cray, Kent, England.

2 Holton's Patent Hatching Apparatus.

Capel's Hatching Apparatus.

Collection of Hatching Apparatus.

Collection of Implements and Appliances for Pisciculture.

Collection of Feeding Apparatus for Fry and older fishes.

Samples of methods of carrying Eggs of Salmon and Trout.

Methods of conveying Fishes long distances.

789. **BINGHAM, G. T.**

Oysters.

790. **BROWN, J.**

Oysters.

GENTLEMEN'S
VENTILATED WATERPROOFS
*In Tweed, Cashmere, Gossamer, and other Materials.*
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**37, Queen Victoria St., London, E.C.**

791. **ASHTON & GREEN, LIMITED,** 11 and 12, 14 and 15, Bury Street, St. Mary Axe, London, E.C., Temple Gate, Bristol, and Festiniog, North Wales.
3 Slate Hatching Troughs.

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DIVISION XXXVIII.

**Models and drawings of diseases of fish, with special reference to their origin and cure.**

**SEARLE, E. W.,** 11 College Place, N.W.
Diseased Salmon, cast and painted to life.

**KING, GEORGE HOADLEY,** Sea Horse House, 165, Great Portland Street.
Large Kelt Salmon, sent to the first Quekett Soirée, with arrow-headed parasites in the gills, taken in Col. Townely's water, Whitewell.

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DIVISION XXXIX.

**Processes for rendering streams polluted by sewage and chemical or other works innocuous to fish life (illustrated by models and drawings).**

**MANUFACTURERS' AND MILLOWNERS' MUTUAL AID ASSOCIATION, THE,** 5 The Sanctuary, Westminster, London, S.W.
Processes for rendering streams polluted by sewage and chemical or other works innocuous to fish life (illustrated by models and drawings).

**NATIVE GUANO COMPANY LIMITED, THE,** Sewage Works, Aylesbury.
Purification of sewage by the Company's processes.
Fish living in water purified by the above processes.
Plans and Models of works for preventing river pollution.
Native Guano, the resulting manure.
Agricultural and Horticultural specimens.
Microscopic Illustrations.

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**SEWAGE PURIFICATION.**
**(A. B. C. PROCESS.)**
In operation at the EXHIBITION (see above) and at the SEWAGE WORKS, AYLESBURY, where all information may be obtained on application to
**THE NATIVE GUANO Co., Limited.**

## Division XL.

**Physico-chemical investigation into those qualities of salt and fresh water which affect aquatic animals; investigation of the bottom of the sea and of lakes, shown by samples; aquatic plants in relation to fishing, &c.; researches into the aquatic fauna (animals of the several classes preserved in alcohol or prepared, &c.); apparatus and implements used in such researches.**

799. **RAE, C. S.**, Allesley, Coventry.
Marine Glasses, Microscopes, and Magnifying Glasses for showing the parasites and disease on fish and the anguillula fluviatilis animalcules found in the intestinal canals of fishes, &c., as exhibited at Edinburgh and Norwich.

## NATURAL HISTORY.

When investigating fisheries, their present uses and the benefits which might be derived from them, the inquirer soon becomes conscious of the necessity of studying many branches of "natural history," both in the vegetable and animal kingdoms, without a competent knowledge of which his labours will often be thrown away, or the results of his researches useless, if not positively misleading.

Fisheries are variously regarded by different classes; thus the fisherman chiefly concerns himself as to what he can obtain from them at the present time, regardless of suitable provisions for the next year's supply. The public mainly interest themselves in the cost of the fish as disposed of for food; while the scientific economist bases his conclusions respecting the value of fisheries in accordance with their produce, and should the supply be unequal to the demand he mostly advocates increased killing powers by the employment of more destructive agencies, erroneously believing that the stock in the sea is inexhaustible.

The naturalist and fish culturist ought to approach the question from an entirely different point of view; he should ascertain the life-history of all forms of fishes, not merely such as serve for human food, but also of those which form the sustenance of the more predaceous kinds. He should endeavour to collect reliable information respecting the plants and animals which afford them sustenance and shelter, as well as ascertain what are their enemies or their friends, and what conditions favour the presence or absence of either class. Irrespective of the foregoing, he should consider the relationship of temperature, currents, soils, and the various conditions of the water in which they reside, to their migrations, growth, health, and reproduction. He should also ascertain whether fish are increasing in numbers, decreasing, or if the supply remains unchanged; if the size of those captured is augmenting or lessening; if their condition is better or worse than it was. Should investigations lead him to conclude that fisheries are being unduly depleted, he should carefully note in what families of fish such is occurring, if possible the cause, while in marine forms it

is likewise necessary to inquire if fishermen have to go further out to sea to obtain their captures, if the killing powers of their implements have increased, and whether more men are now required to obtain the same amount of fish than was the case a few years previously. Lastly, it may be observed that, unless the investigator is able to distinguish the various species, he may easily imagine that he sees in some small forms, as the solonette (*Solea minuta*), the young of the more valuable kinds, as the common sole (*S. vulgaris*), whereas he is merely examining one sort that is worthless, except as food for the larger kinds.

Our fresh-water fishes are divisible into the river or "fluviatile" and the "lacustrine" or lake forms, while our marine ones may be considered as shore or "littoral" and "pelagic" or sea species; these last being again subdivided into such as are generally found near the surface, at greater or mid-depths, and abyssal residents, or such as live in the deep sea, below the limits to which the sun's rays penetrate.

Fresh-water fishes may be permanent residents therein, as carps; "anadromous," or merely visitants from the ocean for the purpose of depositing their spawn, and generally, but not invariably, leaving their young to be reared there, as the salmon: "catadromous," or such as reside in fresh waters, visiting the littoral zone or sea in order to breed, as eels, the young of which ascend into and are reared in our rivers.

To meet the destructive agencies to which the eggs and young are subjected, fish are provided with a large amount of ova, which is mostly sufficient to counterbalance natural waste. Thus eleven millions of eggs have been taken from a 21-lb. codfish; 550,000, from a mackerel; 239,775, from a 4-lb. brill; while a salmon deposits about 800 for every pound's weight of the parent fish. Although most forms are polygamous, some are monogamous. The period of the year at which spawning occurs, the size of the eggs, the depth of water in which they are deposited, the time they take incubating, and the places selected for the ova are exceedingly varied.

The eggs of cod float in the sea until the young emerge, those of the herring sink to the bottom, where by means of a glutinous substance they are attached to sea-weeds, rocks and other objects; those of some species of flat fishes float so long as the water is agitated, subsiding when it is smooth. One form of sea-sucker (*Lepidogaster*) affixes its eggs to the inside of a dead shell as a butterfly does to a leaf. The gar fish (*Belone*) has filaments springing from the outer covering of its ova, which enables them to adhere together in a mass or attach themselves to contiguous substances. Anadromous forms deposit their eggs in running waters, but in different ways; thus the smelt affixes its ova to planks, stones, &c., near high-water mark; the salmon and trout cover theirs with gravel, while the grayling deposits it on the bed of the river. Perch and most carps attach their eggs to water-weeds, sticklebacks construct a nest, while in the tufted gilled fishes, represented by the pipe- and horse-fishes, the male undertakes the functions of a nurse, the eggs for this purpose, up to the period of the evolution of the young, being retained between the ventral fins, as in certain pipe-fishes (*Solenostomus*), in tail pouches as in horse-fishes (*Hippocampus*), or in receptacles on the breast or abdomen as in the pipe-fish (*Doryrhamphus*), or merely in two rows in the same position as in *Nerophis*. The males of some tropical sheat fishes or Siluroids also perform maternal duties by carrying the eggs about in their mouths until the young are hatched. In some forms, as lampreys, the expulsion of the roe is mechanically assisted by the two parents fixing their sucker-like mouths to a convenient rock and entwining themselves round one another.

Also in carps, as in the common goldfish, the male has been observed to roll the female over and over at the bottom of an aquarium until her eggs have become expelled.

Hybrid fishes are likewise deserving of great attention, as in fish culture crosses between the trout and the charr have proved most successful, while the stocking of fresh waters by artificial means, and latterly the sea, are among the most satisfactory accomplishments of modern fish culturists and naturalists.

Young fishes for varying periods after birth are sustained by the nutriment contained in the yolk of the egg or dependent umbilical sac, and during this period they have numerous enemies watching to make them their prey. Unable to stem strong currents, they are generally to be found concealed near the sides of streams or ponds, or else under the shade of stones, leaves of water plants and grasses; while the marine species are among the algæ in the sea, or disporting themselves in the sunshine, and these places may be considered their nurseries, which should not only be left undisturbed, but protected from predaceous foes. As the yolk sac becomes absorbed, the fry of fish have to seek for their food, whether of a minute vegetable or animal character, and it is then that the eggs and young of other lower classes of animals (the invertebrata) become invaluable for their subsistence.

In some places around our coasts or in fresh or brackish waters are various kinds of sea-weeds or algæ which in the sea decrease in abundance with increasing depth, or should they drift into deep water they fall to pieces, sink and form the basis of soft black mud in which many forms of invertebrates find their food, while in their turn they afford sustenance for fishes. Besides sea-weeds being useful along our coasts as providing food for fishes, places for depositing their spawn, nurseries for sheltering and rearing the fry, there are likewise forms, some of which are microscopic, floating in vast quantities over the surface of the deep sea, as the so-called Sargassum or gulf weed.

Sponges, in both their fresh-water and marine kinds, and which equally belong to the group Protozoa, were long considered by some authors to be vegetable, by others to be animal organisms. The horny skeletons of some species are exceedingly useful for domestic purposes, while those of commerce are to a great extent brought from the Grecian Archipelago, the Red Sea and the Bahamas, where they are obtained by divers.

Many of the Cœlenterata, as the compound colonies of the fixed and plant-like sea firs (*Sertularidæ*) and their allies, are found in our seas, some in large quantities, and they are consumed by fish and other marine animals. There are also in this group the jelly-fishes, medusæ, which during the summer and autumn months are found floating in the ocean around our coasts, and occasionally under their umbrella-like discs young fish have been observed to obtain refuge from the pursuit of their enemies.

Corals among the Actinozoa in many ways hold a most important place, while their hard structures are exceedingly diversified and interesting. Commercial forms are principally obtained from the Mediterranean, the Red Sea, Persian and Arabian Gulfs, the Mauritius, the Islands of the Malay Archipelago, Japan, &c.; while the reef-constructing species are distributed, and can only exist where the mean temperature of the sea is not below 66°. The coral reefs are classed as forming Fringing reefs, Barrier reefs and Atolls. These reefs are largely frequented by fish, some of which possess most gorgeous colours, but in many instances it has been observed that the flesh of those obtained from such localities is frequently poisonous.

Among the jointed Annuloida the term entozoa has been frequently used for the purpose of designating internal parasites. Epizoa on the other hand is the term employed for certain small Crustaceans which, in their adult stage, are likewise parasitic upon the exterior of fish; they possess a suctorial mouth and limbs furnished with hooks, suckers or bristles.

Mollusca, or soft-bodied animals, commonly known as shellfish, constitute a most important class in the economy of fisheries, not merely in their providing adult fish with food, but also as some of them breed at the same period of the year, their eggs and microscopic young are useful as aliment to the fish fry. Some forms are likewise more directly employed by man as food and bait, as oysters, mussels, cockles, and periwinkles. The consumer needs no reminder as to how scarce the first have become; and along the east coast of Scotland mussels for use as bait are attaining famine prices, while the belief appears to be almost general that there mussel fisheries are retrograding. Many other forms of molluscs are much employed by line fishermen for bait, especially whelks, squids, cuttle-fishes, &c.

Among the marine Echinoderms, viz. sea-urchins, star-fishes, and the sea-cucumbers, *Holothuridæ*, all assist more or less in providing food for fish, while a species of the last is largely consumed as food in China, where it is looked upon as a luxury under the name of "trepang."

The true worms or Annelides are indispensable to fisheries. They are divisible into the abranchiata, or gill-less forms, which contain earth-worms and leeches, and the branchiata, or gilled kinds, which include tube-worms and sand-worms, &c. The Annelids comprise many forms largely employed as food for fish, and some, as the lob-worm, are very useful for bait; others, as leeches, are detrimental to fish.

Insects have been said to be nature's most favoured creation, having combined in them all that is beautiful and graceful, interesting and alluring, or curious and singular in every other class of her (nature's) productions. They are placed by entomologists in three great divisions, in accordance with whether they pass through a metamorphosis or not, and if they do whether such is complete or incomplete. Many insects form food for fishes in some stage of their existence, while others are very destructive to fish eggs.

Crustacea are most generally known as lobsters, crabs, shrimps, prawns, &c., and are variously divided by different zoologists. All crustacea are water breathers; some having eyes placed upon footstalks, while in others they are without stalks, being sessile or immovable. All undergo successive moultings or changes of shell, at which times lost parts become renewed. In the earlier stages of the lower crustaceans, they emerge from the egg as a small body, having a central eye and two pairs of limbs (so-called Zoea stage), while as they gradually attain the adult stage new segments and new limbs appear. In their earlier stages crustacea become a most important article of food for fishes, while their adult forms are likewise esteemed by the more predaceous kinds.

The class of Amphibia comprises newts, frogs and toads, and in some localities frogs play a not unimportant part in fisheries, as they not only devour the ova but likewise the fry, while their own spawn in turn becomes food for fish and a frog is highly esteemed by many fresh-water fishes. Reptiles (or Reptilia), including tortoises, turtles, terrapins, snakes, lizards, crocodiles and alligators, are more destructive to fish than are the true amphibians. The Chelonians are usually divided into the swimming turtles, the mud turtles or soft tortoises, and the terrapins, and lastly the land tortoises. Some of the snakes and serpents are fre-

quently found in fresh water, where they are inimical to fish; while in the seas of hot climates are the venomous water-snakes (*Hydrophidæ*); these have a laterally flattened tail, lead an aquatic life, and live mostly on fish. Crocodiles and alligators abound in the fresh and brackish waters of hot countries and are large consumers of fish, but the form best adapted for this pursuit is perhaps the gavial of India, which often attains to twenty feet in length, and is a resident throughout the Indus, Ganges, Brahmaputra and Mahanuddi rivers. The gavial possess a long and slender snout with a narrow mouth, they toss captured fish into the air, and as they descend catch them and swallow them head first.

Among birds, as is well known, not only are the swimming ones, as the gannets, cormorants, gulls and terns of our coast, largely destructive to sea fish, but the last two extend their range to inland waters, where, however, the dabchicks, coots, moorhens, herons, &c., assist in depopulating fisheries.

Among mammals the whale and seal fisheries are of great importance commercially. The whales, dolphins, and porpoises or Cetacea themselves destroy immense quantities of fish. So also do the semi-aquatic or amphibious seals; while the otter in fresh and brackish waters is a large fish consumer, although in the east it appears mostly to prefer frogs.

FRANCIS DAY.

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## DIVISION XLI.

### Acclimatisation of fish.

800. **SILK, W. T.**, for the Marquis of Exeter, Burghley Park, Stamford.
Illustrations of the acclimatization of Fish.

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## DIVISION XLII.

[AQUARIA.]

### Specimens living (marine and fresh water), fresh, stuffed or preserved, casts, drawings, and representations of—

(*a*) Algæ to be arranged under genera and species with localities appended

805. **BROTHERSTON, ANDREW**, Shedden Park Road, Kelso, N.B.
Collection of British Aquatic Plants (exclusive of Algæ).

806. **COOK, JAMES**, 3 Moss Street, Paisley, N.B.
Collection of British Marine Algæ.

807. **WHITSTABLE COMPANY OF FREE FISHERIES AND DREDGERS**, in the County of Kent, known as "*Whitstable Oyster Company*," Thomas G. Browning, Clerk, Whitstable.
Algæ.
Sponges.
Zoophytes, &c.

## Division XLIII.

(*b*) Sponges, in their natural state.

**CRESSWELL & CO., R.**, 32 Red Lion Square, London, W.C., Sponge Importers and Merchants, and at Piræus and Smyrna.
Sponges of all descriptions: in their natural condition and cleaned ready for use.

**RAPP, L. F.**, 4 Grove Place, West End, Hammersmith, London.
Group of Venus's Flower Baskets (*Euplectellæ speciosæ*) from the Philippine Islands.

**GARDNER, MISS** (the collection of the late Mrs. Gardner), Hampstead, London.
Sponges, &c., in their natural state.

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## Division XLIV.

(*c*) Corals, in the natural state, polyps, jelly-fish, &c.

**BRASSEY, LADY**, Normanhurst Court, Battle, Sussex.
Large series of Corals, Sponges, and Gorgoniæ, from the Indian, Japanese, Fijian, and Australian Seas—including the following species new to science: Distichopora Brasseyi, Distichopora Allnutti, Balanophyllia Kalakauai, and Brasseyia radians; described in the Ann. and Mag. Nat. Hist., vol. ix. No. 50, 1882, by Mr. Bryce Wright, F.Z.S. Collected during the Voyage of the "Sunbeam."

**BRAZENOR, CHARLES**, 39 Lewes Road, Brighton.
Model of Octopus, taken from specimen lately in the Brighton Aquarium.

**BURROUGHS, Lieut.-Gen. F. W. TRAILL, C.B.**, Rousay, Orkney, N.B.
Specimens of White Coral found on the shores of Rousay, Orkney, N.B.
Specimens of Shell Sand found on the shores of Rousay, Orkney, N.B.

**TIDMAN'S SEA SALT,**
**FOR PRODUCING A SEA BATH IN YOUR OWN ROOM.**
*Patronised by the Royal Family.*
**Sold Everywhere, in Bags and Boxes.**

823 *a*. **LEE, HENRY,** 42 Holland Street, Blackfriars Road, London.
Mollusca.

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DIVISION XLVIII.

(*g*) Worms used for bait, or noxious; leeches, etc.

824. **McINTOSH, PROFESSOR,** M.D., LL.D., F.R.S., University St. Andrews, and Murthly, N.B.
Series of Original Coloured Drawings of Annelids, by the late Miss Roberta McIntosh (Mrs. Albert C. L. Günther). Prepared for the illustration of the "British Annelids," in course of publication by the Ray Society.
Series of Original Coloured Drawings and Oil Painting, by the same lady, illustrative of the rarer Marine Animals of St. Andrews.

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DIVISION XLIX.

(*h*) Perfect insects and larvæ of insects, which are destroyers of spawn or serve as food for fish.

825. **EEDLE, J.,** 40 Goldsmith Row, Hackney Road, London.
Insects injurious to Fish.
Insects food of Fish.

826. **THOMSON, JOHN,** 1 Main Street, Inverallochy, Fraserburgh, Aberdeenshire.
Specimen of Food of Fishes preserved in bottles.

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DIVISION L.

(*i*) Crustacea of all kinds.

827. **LAUGHRIN, WILLIAM,** Polperro, Cornwall.
Two Cases of Crustacea.
Collection of about 100 kinds, all English, found on coast of Cornwall.
Crabs, 12 lbs. and 13 lbs. weight when living.

ARMY REGULATION
WATERPROOF.
ANDERSON, ABBOTT, AND ANDERSON'S
WATERPROOF.
GROUND SHEETS.

**LOVETT, EDWARD,** 55 George Street, Croydon.
Microscopic Preparations by a new and approved method by which the living appearance of the specimen is preserved; illustrating the embryology and anatomy of the Crustacea and other branches of Marine Fauna of the British Islands.

**POLAND BROTHERS,** Billingsgate.
One Case (Glass) containing a very large male Lobster caught off St. Ives, Cornwall.
One Case (Glass) containing a very large male Craw-fish caught off St. Ives, Cornwall. Also, in same case, a male Crab, caught off Start Point, Devon, and a peculiar pale-blue Lobster from Norway.

**SAYER & CO.,** 100 Lower Thames Street and Billingsgate, London.
1 Lobster, 12 lbs. weight.

**CARRINGTON, J. T., F.L.S.,** Royal Aquarium, Westminster.
Collection of Preserved Specimens of British Stalk-eyed Crustacea of the three divisions—Macrura, Anoumara, and Brachyrura, and including all the species used as articles of food, collected and prepared under the direction of Mr. Carrington.

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## Division LI.

(*k*) Fish of all kinds.

**ARNOLD, EDWARD,** Campbell Yard, High Street, Huntingdon.
Glazed Case containing Stuffed Specimen of a Rudd. Weight 2¾ lbs.

**ARNOLD, JOHN WILLIAM,** 9 Park Street, Deal.
A small collection of Curious Sea Fish.

**ASHMEAD, G. B., & CO.,** Naturalists, 35 Bishopsgate Street, London, E.C.
Trophy of Freshwater Fish entitled "The Rod."
Freshwater Fish—Barbel, Trout, &c.
Companion do.—Carp, Bream, &c.

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ANDERSON, ABBOTT, & ANDERSON,
37, QUEEN VICTORIA STREET, LONDON, ENGLAND.
*Largest Manufacturers in the World of the*
BEST OILSKIN CLOTHING.
**Prize Medals from all International Exhibitions.**

**ASHMEAD, G. B. & CO.,**—*continued.*
Jack.
Salmon.
Piscatorial Screen.
Ditto Marine.
Ditto Table and Lamp.
Trophy of Fish-eating Birds, "The Gun."
Herons, &c., Aquatic.
Divers, &c., Marine.
Seal and Prey, ditto.
Otter and Prey, Aquatic.
Small Groups illustrative of vicissitudes of Fish and Bi Life.
Preserved Bird-skins used in the manufacture of artific flies.

835. **BARBER, W.**, Naturalist, 19 Sincil Street, Lincoln.
Stuffed Pike, weight 8 lbs., and group of Perch and Roach case. This is a new and improved process for preservin much of the natural colours as possible without the addi of paint or any other material whatsoever.

836. **BARR, B.**, 44 Hemsworth Street, Hoxton.
Stuffed or Preserved Dace, weight 1lb. 1½ oz.

837. **BEASLEY, A. W.**, 14 Greville Place, Maida Vale, N.W.
Stuffed Specimen of a "Pike-Perch" (*Lucioperca sandra*) the Danube, weight 12 lbs. in Glazed Case.

838. **BERMONDSEY BROTHERS ANGLING CLUB,** A Arms, Alscot Road, Bermondsey.
Perch in Case.
Roach in Case.
2 Roach in Case.
Rudd in Case.
Carp in Case.
Jack.

839. **BIRMINGHAM AND MIDLAND PISCATORIAL AS CIATION,** James Gregory, Hon. Sec., 39 Vyse St Birmingham.
Pike 27 lbs.
Pike 28 lbs.
Pike 20 lbs.

**G. LITTLE AND CO.,**
*FISHING ROD AND TACKLE MAKER*
**GOLD MEDAL AND DIPLOMA OF HONOUR.**
Being the Highest Award at the NATIONAL FISHERIES EXHIBITI at Norwich, 1881.
**15, FETTER LANE, LONDON, E.C.**

**BIRMINGHAM AND MIDLAND PISCATORIAL ASSOCIATION**—*continued.*

Pike 20 lbs.
Pike 18 lbs.
Pike 18 lbs.
Barbel 13¼ lbs.
Barbel 8 lbs.
Barbel 6½ lbs.
Bream 5½ lbs.
Bream 4 lbs.
Perch 2 lbs. 2 oz.
Salmon 18 lbs., killed by a larger fish in the River Trent, presented to the Association by Alan Bagot, Esq., Trent Conservator.
Perch 10¼ lbs., taken on one of the Norfolk Broads.
Roach 1¾ lbs.
Roach 2 lbs.
4 Chub 16 lbs.
Char.
Perch 1¾ lbs.

**BROOKWELL, H. G.,** 15 Belmont Villas, Leyton Road, Leyton.

Twenty-five Cases Stuffed Fish.

**BROTHERSTON, ANDREW,** Shedden Park Road, Kelso, N.B.

Cases of Stuffed Salmondiæ from the Tweed, in various stages and conditions.—Old Red Kipper (male) Salmon, 44 lbs., length 50 inches (Kelso Museum); Kipper, 30 lbs.; ditto, 20 lbs.; Red ditto, "Gray School," 20 lbs.; Black ditto, 17 lbs.; Baggit Salmon (unspawned female), 21 lbs.; ditto, affected with *Saprolegnia ferax*, 17 lbs.; kelt (spawned female), ditto 13 lbs.; Clean Salmon, slightly diseased on nose, 10 lbs.; kipper grilse, 8½ lbs., &c., preserved and exhibited by A. Brotherston.

**BRUNTON, JOHN, M.A., M.D.,** 21 Euston Road, London, N.W.

Case of Lea Trout, Stuffed Jack, Grayling.
Case of Lea Trout, taken by artificial fly on fine gut and landed without net, gaff, or assistance, 5 lbs., 4¼ lbs., 3½ lbs.

THE IMPROVED
VENTILATED FISHING JACKETS,
MADE ONLY BY
ANDERSON, ABBOTT, & ANDERSON.

**BRUNTON, JOHN**—*continued.*

Jack, 4¼ lbs., taken when fly fishing on single hair, and landed without net, gaff, or assistance.

Case of seven Grayling, caught with artificial fly on fine drawn gut, 3½ lbs. to 1½ lbs. each.

843. **BUNN, HENRY HOWARD,** Palmerston House, Ventnor, Isle of Wight.

A Lump Sucker, caught at St. Leonards, January 8th, 1883. Length 22 in., depth 13 in., weight 16½ lbs. Stuffed and set up by Exhibitor.

844. **BUTLER, JOSEPH,** "True Waltonian Society," "White Horse," 80 Liverpool Road, E.

One Chub. (Cast).

845. **CALLAGHAN, JAMES,** 36 St. Mary at Hill, Eastcheap, London.

A Thames Chub, taken by the Exhibitor with rod and line, weight 5 lbs. 12 oz.

846. **CARELESS, GEORGE DYER,** 52 Arundel Street, Landport, Portsmouth.

1 Case of Sea Fish and Rocks.

847. **CARR, WALTER PATERSON,** High Street, Berwick-on-Tweed.

A Sea Wolf, caught in Berwick Bay. Weight, 33 lbs.
Sea Parrot.
Porpoise.
A Collection of deep-sea fish.
Sturgeon.
Sea sow.
Cock Peddle.
Cod.
Codling.
Haddock, a Coal Fish.
Whiting.
Ling, Turbot, &c., &c.
All stuffed.

848. **CLIFFORD, J. W.,** Three Colts, Cambridge Road, Bethnal Green.

Preserved Barbel in Case, 12 lbs. (freshwater specimen).

**ANDERSON, ABBOTT, AND ANDERSON'S**

LEATHER LINED **FISHING BOOTS** REQUIRE NO DRESSING.

**37, Queen Victoria Street, London, E.C.**

49. **COBURN, FREDERICK,** 7 Holloway Head, Birmingham.
Collection of Stuffed Freshwater and Sea Fish, exhibited without special regard to weight of fish, but to show correctness of outline, skill in the manipulation of fins, reproduction of natural colours, and improvements in fitting up cases.
Sword Fish.

50. **CONVIVIAL ANGLING SOCIETY,** Bull and Bell, Ropemaker Street, Finsbury.
Case of Specimen Carp.
Case of 3 Specimen Bream.
Case of 6 Specimen Roach.

**CRESSWELL, HENRY,** "True Waltonian Society," "White Horse," Liverpool Road, Islington, N.
Case 1 Chubb, 6 lbs. 2 oz., valued at £5.

**CURTIS, E., JUN.,** Mortimer Lodge, Upton, Essex.
2 Cases containing Thames Trout.
Case containing Head of Jew Fish, caught by Messrs. Curtis and Senior, ledgering, Brisbane River, Queensland, Australia. While playing same, a shark took off half the fish below the dorsal fin. What we gaffed weighed 28½ lbs. Prawn bait.

**DAY, DR. FRANCIS,** Leamington House, Cheltenham.
Complete series of British Sea and Inland Fish.

**DA COSTA, HYMAN,** 18 Peter Street, Tyssen Street, Bethnal Green.
2 Jack.
1 Barbel.
2 Chub.
2 Carp.
2 Perch.
2 Tench.

**DAVIE, JOHN HUNTER,** of the "West London Angling Club," 49 Shaftesbury Road, Hammersmith, London.
One Stuffed Roach in case, 2¼ lbs., caught at West Drayton.

**EASTWOOD, G. J.,** Cheshunt, Herts.
Bream. weight 7¼ lbs., taken by Mr. G. J. Eastwood, in his private fishery, King's Weir, Cheshunt, Herts.

ANDERSON, ABBOTT, & ANDERSON'S
**PORTABLE INDIA-RUBBER BATHS**
Fold into very small compass.
37, QUEEN VICTORIA STREET, LONDON, E.C.

857. **EDWARDS, HENRY,** 100 High Street, Kingsland, London, E.
Beautiful specimen of small Pike stuffed, weight 4 lbs., caught at Little Waltham, Essex, 2th August, 1880. "Dead bait," Roach.

858. **EEDLE, THOMAS,** 40 Goldsmith Row, Hackney Road, London.
Preserved Fish, Pike, Perch and Tench.

859. **EILOART, E. G.,** 33 George Street, Hanover Square, W.
6 Cases Stuffed Fish, preserved and cased by an amateur. Rudd, 2 lbs. 10 oz.; Head of Pike, 16½ lbs.; Trout, 2½ lbs.; Bleak (on wood) specimen for size only.

860. **ELLIS, JOHN,** Pritchard's Arms, Hackney Road.
Preserved Carp.

861. **ERNE FISHERIES,** Ballyshannon, County Donegal, Ireland.
Case of stuffed specimens of products of Lake and River Erne.

**MOORE, ROBERT L., D.L.,** Moluman, Londonderry.
1 Cock Spait Salmon.
1 Lake Trout.
5 varieties White Trout.
2 varieties Brook Trout.
1 Pike.
1 Silver Eel.
2 Bream.
1 Large Pike.
2 Char, L. Melvin.
2 Pollen.
1 Otter.

**RIVER SHANNON,** Co. Clare.

**REEVES, ROBERT W. C.**
1 Angel Shark, taken near Kilrush in Shannon.
1 Large Seal " "

**DUBLIN BAY.**

**WILLIAMS & SON,** Dublin.
1 Case of Sea Birds.

862. **FOOT, W.,** 21 Waterside North, Lincoln.
One Roach Stuffed, weight 2 lbs. 4½oz., in case natural, and caught by Exhibitor at Bardney near Lincoln.
Barbott (or *Eelpout*) 4½ lbs., in case, caught by Exhibitor at Bardney, near Lincoln.

**ANDERSON, ABBOTT, & ANDERSON'S**
**SHOOTING WATERPROOFS,**
**Ventilated and absolutely Waterproof.**
37, QUEEN VICTORIA ST., LONDON, E.C.

**FRASER, SIMON,** 11 Huntly Place, Inverness, N.B.
Glass Case of Salmon and Grilse, loch and river Trout.

Glass Case of sea fish, "general" specimens, including two rare specimens of the Wrass.

**FRIENDLY ANGLERS' SOCIETY,** The Albion, Albion Street, Hyde Park, London, W.
80 Cases Stuffed Fish. Trout, 10 lbs. 13 oz.; Jack, 35 lbs.; Perch, 3 lbs. 2 oz.; Roach, 2 lbs. 5 oz.; Dace, 14½ oz.; Bream, 6 lbs. 8½ oz.; Carp, 8 lbs.; Chub, 5 lbs. 12 oz.; Barble, 9 lbs. 3 oz.; Tench, 8 lbs. 8 oz.; Rudd, 2 lbs. 3 oz.; Grayling, 2 lbs.

**GATHERCOLE, GEORGE,** 112 Akerman Road, Brixton.
A small case containing a preserved and mounted Grayling. Weight 2 lbs. 6 oz.

**GEORGE, ALFRED,** 2 Dempsey Street, Commercial Road, London, E.
Case of 1 Stuffed Chub, 5½ lbs. weight.

**GEDNEY, C. W.,** Bromley, Kent.
Thames Trout in case, 10 lbs. weight, taken with spinning bait.

**GILL, ALEXANDER,** Stebwye Road, High Crossham, Tottenham.
1 Case Preserved Fish, 15 × 12 inches.

**GILLETT, JOHN,** 40 Fetter Lane, Holborn.
Stuffed Perch, weighing 5 lbs.

**GOOD INTENT ANGLING SOCIETY, THE,** Richard Murphy, Secretary, The Crown Inn, Church Street, Shoreditch.
40 Cases of Stuffed Fish, consisting of Roach, Dace, Pike, Trout, Perch, Tench, Bream, Rudd, Carp, &c.

**GOUNDREY, JOHN,** 109 High Street, Oxford.
Gar Pike, 2½ lbs.

**GRAY, HENRY,** 55 Charlotte Street, Portland Place.
A Case containing two Trout caught with fly, weight 4 lbs. 4 oz. and 4 lbs. 5 oz.

India-Rubber Belting. India-Rubber Lined Fire Hose.
Leather " " " Delivery and Suction Hose.
Gutta " " " Steam Hose.
Patent Corrollum " Woven Canvas Hose (Seamless).
India-Rubber Sheet, Valves, Buffers, Washers, Tubing, Packing, Mats, Cords, Tyres, Squeegees, &c.
ANDERSON, ABBOTT, & ANDERSON,
INDIA-RUBBER MANUFACTURERS.
Contractors to the Admiralty, the War Office, Metropolitan Board of Works, and London Metropolitan Police.

873. **GREAT NORTHERN BROTHERS ANGLING SOCIETY,** 67 Southampton Street, Pentonville, N.

Twenty cases, Preserved Fish.

Case containing two Bream, taken by Mr. W. Theobald from the River Wey at Woking, 17th October, 1880. Weights, 6 lbs. 9½ oz. and 4 lbs. 0½ oz. All fish are taken from the bank.

874. **GRESHAM ANGLING SOCIETY,** Mason's Hall Tavern, Mason's Avenue, Basinghall Street, E.C.

1 Case of 3 Pike, united weight 59½ lbs.

3 Cases of Perch. 1 in case alone, weighing 4 lbs.; 3 in case, weighing 8 lbs. 4 oz., largest 3 lbs. 7 oz.; 2 in case, weight 5 lbs. 2 oz., largest 3 lbs.

1 Case of Barbel caught with extremely light rod, shown in case.

7 Grayling in one case; largest, 2¼ lbs. Specimens from a take of 25 brace.

875. **GUNN, E. W., JUN.,** 47 Upper St. Giles Street, Norwich.

Six Cases of Stuffed Perch, Roach, Dace, Rudd, Bream, &c., caught near Norwich.

876. **GUNN, T. E.,** 47 St. Giles Street, Norwich.

Collection of Stuffed British Sea and Fresh Water Fish, comprising 63 species, and about 250 specimens, including brace of Perch, weighing 8¼ lbs., monster Sea Perch of 17 lbs., several Pike, one of 30 lbs., Sticklebacks, four species of Bream, and notably the largest individual in England, weighing 11½ lbs., Mackerel, Wrasses, Carp, Crucian Carp; Gold Carp, 16 oz.; Barbel, 11½ lbs.; Golden and Common Tench; Roach, one of 2¼ lbs.; Azurine Chub, 5½ lbs.; Minnow, 4 inches in length; Herring, Grayling, Smelt, Whiting Pout, 3 Bearded Rockling, Broad-nosed Eel, 7 lbs., large Lump Suckers, Sharks, and others, nearly all caught in the county of Norfolk. They are mounted in groups, some representing remarkable incidents, illustrating life below the surface.

Collection of Stuffed British Reptiles, consisting of Frogs, Natter-Jack and Common Toads, &c., caught around Norwich. These include a remarkable monstrosity of a Toad having five distinct and well-formed legs; it was taken alive at Cossey, near Norwich, in May 1882.

**ANDERSON, ABBOTT, & ANDERSON'S**
**IMPROVED**
RIDING OR HUNTING WATERPROOFS,
**WITH LEGGINGS ATTACHED.**
37, QUEEN VICTORIA ST., LONDON, E.C. WORKS—LIMEHOUSE, E.

**ARDING, CHARLES W.**, Assoc. M. Inst. C.E., King's Lynn, Norfolk.

Specimens of Smelts and other Fish in spirit.

**AYWARD, THOMAS**, 275 Kennington Road, S.E.

Case of 4 Perch. Weights, 3¼ lbs., 2¾ lbs., 2½ lbs. and 2¼ lbs. Total 10¾ lbs. Taken by Exhibitor, March 11th, 1811, in an afternoon in private water at Staines. The largest fish was hooked a fortnight previous to time of capture, and when landed contained a portion of my line and hook in its gullet.

**ODGES, W. J.**, Aucuba Villa, Lavender Hill, S.W.

Throat Teeth of Barbel, Chub, Carp, Tench, Bream, Roach, Rudd, &c.

**OLT, EARDLEY CHAUNCY**, The Cottage, East Sheen, Mortlake, Surrey.

A Pike's Head. The Pike weighed 38 lbs.: has a large Perch in its mouth.

A Pike's Head. The Champion Pike's Head of England. The fish was caught in Turner's Pond, near St. Leonard's Forest, Sussex, fifty years ago, and till within the last ten years was in the possession of the late Mr. Borrer, of Henfield, Sussex. The fish when caught weighed 48 lbs.

**ORSLEY, CHARLES W.**, Fakenham, Norfolk.

Case Stuffed Trout, weight 9 lbs. 11 oz.

Case Stuffed Trout, weight 9 lbs. 13 oz. Taken by Exhibitor in the River Wensum with Phantom Minnow. Landed after about twenty minutes' play.

**OWLETT, W.**, High Street, Newmarket.

36 Cases of Fish, Roach, &c., beside the special fish.
Monk Fish or Angel Shark, caught at Lynn, Norfolk.
1 Freshwater Eel, taken in Suffolk, weight 30¼ lbs.
1 Burbot or Eel Pout, taken in Cambridgeshire, weight 4¼ lbs.
1 Dace, taken in Suffolk, weight 1 lb. 1 oz.
1 Carp, taken in Cambridgeshire, weight 9 lbs. River fish.
1 Chub, 6 lbs.
2 Roach, 4 lbs. 2 oz.

WATERPROOF CANVAS
**AGS, HOLDALLS, AND KNAPSACKS**
of every description for Travellers and Sportsmen.
NDERSON, ABBOTT, & ANDERSON,
37, QUEEN VICTORIA STREET, LONDON, E.C.

**HOWLETT, W.**—*continued.*
1 Pike 27½ lbs.
2 Perch, 8 lbs. the two.
All taken from the Rivers Ouse and Lark.

883. **HOXTON BROTHERS ANGLING SOCIETY,** "Che
Tree," Kingsland Road, N.
Preserved Stuffed Freshwater Fish in cases.
2 Pike, R. Ghurney.
3 Perch, A. Brockett.
1 Pike, J. Romer.
1 Bream, J. Morgan.
1 Perch, G. H. Wood.
1 Roach, J. Amos.
2 Tench, Jackson.
1 Chub, H. Steadman.
1 Roach, A. Pollard.
1 Roach.
1 Tench, J. Haggett.
2 Roach, J. Moore.
1 Roach, J. Cocks.
2 Gold Carp, J. Benjamin.
1 Tench, E. Brockett.
1 Chub, Stigwood.
1 Roach, Jenkins.
1 Tench, R. Ghurney.
1 Dace, B. Barr.
1 Roach, A. Hattemore.
1 Trout, J. Mann.
1 Perch, J. Mann.
1 Perch, J. Mann.
1 Perch, J. Mann.
2 Chub, Tricker.
1 Bream, J. Aldrige.

884. **HUGHES, T. S.,** Foxley Road, North Brixton.
11 cases Pike.
6 cases Roach.
3 cases Trout.
3 cases Grayling.
1 case Barbel.
2 cases Perch.

Waterproof Aprons, Trousers, and
Petticoats for
GUARANTEED.
PUNT FISHING.
MAKER
37, Queen Victoria St.,
ANDERSON, ABBOTT, & ANDERS

**UGHES, T. S.**—*continued.*
Barbel, 12 lbs.
Bull Trout, 16 lbs.
One Pike, 26 lbs.
One Trout, 6½ lbs.
One Perch, 3 lbs.
One Roach, 2 lbs. 7 oz.
One Grayling, 1 lb. 9 oz.

**AAK WALTON ANGLING SOCIETY (THE),** The "Old King John's Head," Mansfield Street, Kingsland Road.
Six Cases of Pike.
Seven Cases of Bream.
Three Cases of Roach.
Three Cases of Tench.
Two Cases of Carp.
Two Cases of Chub.
Two Cases of Perch.
One Case of Barbel.

**RDINE, ALFRED GEORGE,** 38 Old Change, E.C.
Case of Pike, 2, 18 lbs. and 22 lbs., gross weight 40 lbs.
Case of Pike, 1, gross weight 30½ lbs.
Case of Pike, 1, gross weight 23 lbs.
Case of Pike, 2, 18 lbs. and 22 lbs., gross weight 40 lbs.
Case of Pike, 1, gross weight 20 lbs.
Case of Pike, 2, 14½ lbs. and 17½ lbs., gross weight 32 lbs.
Case of Trout, 1, gross weight 26 lbs.
Case of Trout, 1, gross weight 19 lbs.
Case of Trout, 7, gross weight 22½ lbs.
Case of Trout, 1, gross weight 8 lbs.
Case of Bass, 1, gross weight 13¼ lbs.
Case of Perch, 7, gross weight 18 lbs.
Case of Roach, 2, gross weight 3¾ lbs.
Cast in Basket, Pike, gross weight 36 lbs.
Cast in Basket, Pike, gross weight 30½ lbs.
Cast in Basket, Pike, gross weight 26 lbs.
Cast in 5-in. cabinet, Perch, gross weight 12½ lbs.
Cast of Lump Sucker, "Cyclopterus Lumpus," gross weight 27 lbs.

**RDINE, FREDERIC,** 38 Old Change, E.C.
Cast of Fish on Plate.

INDERSON, ABBOTT & ANDERSON'S
PATENT HYGIENIC VENTILATED
WATERPROOF COATS.
7, Queen Victoria St., London, England.

**BENNINGFIELD, T.**, Broxbourne, per Alfred G. Jardine.
Case of Three Bream, 21 lbs. gross weight
Case of One Carp, 14¾ lbs.
Case of One Bream, 8 lbs.
Case of One Trout, 11¾ lbs.
Case of One Trout, 11½ lbs.
Case of One Pike, 22¾ lbs.
Case of Three Tench, 9 lbs.
All these sp mens were cau in the River L

**CRITCHFIELD, A. C.**, 1 Pownall Road, Queen's Road, Dalst London, E., per Alfred G. Jardine.
Case of 3 Tench, weight 9 lbs.
Case of 1 Tench, weight 4½ lbs.
Case of 1 Barbel, weight 8 lbs.
Case of 1 Rudd, weight 1¼ lbs.
Case of 1 Eel, weight 5½ lbs.
Case of 1 Pike, weight 14 lbs.
Case of 1 Dace, weight 1 lb.
Case of 1 Roach, weight 1 lb. 11 oz.
Case of 1 Perch, weight 3½ lbs.
Case of 1 Perch, weight 2½ lbs.

**FEATHERSTONE, R.**, Aldershot, per Alfred G. Jardine.
One Case Large Pike.
One Case Large Pike.
One Case Large Pike.
One Case Two Chub.

**KING, ROBERT**, Teddington, per Alfred G. Jardine.
One Case Trout, Thames, 12 lbs.

**JACKSON, R.**, Little Marlow, per Alfred G. Jardine.
One Case Thames Trout, 10 lbs. 9 oz.

**CROWLEY, WILLIAM**, 20 Cloudesley Square, per Alfr Jardine.
One Case of Four Barbel, 27 lbs. gross weight.

**GANT, J. W.**, per Alfred G. Jardine.
One Case Barbel, 10 lbs. 11 oz.
One Case Chub, 5 lbs. 4 oz.

**SANDERS, S.**, per Alfred G. Jardine.
One Case Three Gold Carp.

ANDERSON, ABBOTT, & ANDERSO
BOOTS, TROUSERS, STOCKINGS, FISHING BRO BA CO
ARE UNEQUALLED.

**BENNYFIELD, WILLIAM,** per Alfred G. Jardine,
2 Cases of Stuffed Fish.
Case of Pike, 2, 36 lbs. and 37 lbs., gross weight 73 lbs.

**KNECHTLI, JOHN,** 6 Carey Lane, London, E.C.
One Case of Stuffed Fish (three Pike).

**LAUGHRIN, WILLIAM,** Polperro, Cornwall.
Sturgeon (½ cwt.), 7 feet long.

**LEWIS, MARCUS HEDGES,** Ham, near Newbury, Berkshire.
Specimen Fish in cases, out of upwards of 4000 caught with rod and line by Exhibitor in the River Kennet.
Barbel, 14 lbs.
Chub, 5 lbs. Length, 21½ inches; Girth, 14 inches.
Pike, 25 lbs. Length, 41 inches; Girth, 20½ inches.
Perch, 2½ lbs.
Trout, 9¾ lbs. Length, 27 inches; Girth, 16¼ inches.
Trout, 8¾ lbs. Length, 26½ inches; Girth, 15 inches.

**NEWBURY AND DISTRICT ANGLING ASSOCIATION, THE,** Secretary, Mr. J. Smith, 62 Northbrook Street, Newbury, Berks.
A Trout weighing 20 lbs. caught by the Earl of Craven in the Kennet near Newbury.
A Trout weighing 18¼ lbs. caught by the Earl of Craven in the Kennet near Newbury.
A Trout weighing 10½ lbs caught by the Earl of Craven in the Kennet near Newbury.
A Trout weighing 8 lbs. caught by the Earl of Craven in the Kennet near Newbury.
A Trout weighing 11¼ lbs. presented to the Association by the late Mrs. E. Knight, and caught in the Kennet at Newbury.
A Trout weighing 8½ lbs. caught by Mr. W. Allaway in the Kennet at Newbury.
A Pike caught in the Kennet and Avon Canal near Newbury.
A Pike weighing 25½ lbs caught by Mr. T. A. Newton in the water belonging to W. Chatteris, Esq., of Sandleford, near Newbury.

ANDERSON, ABBOTT, AND ANDERSON'S
FISHING HATS AND SOU'-WESTERS
ARE THE BEST.
37, QUEEN VICTORIA STREET, LONDON, E.C.

**NEWBURY AND DISTRICT ANGLING ASSOCIATION, THE**—*continued.*

A Pike weighing 17¾ lbs. caught by the late Mr. B. Fielder at Halfway near Newbury.

A Perch caught by Mr. Clarke in the Kennet at Newbury.

A Case containing 3 Perch caught in the Kennet at Newbury.

A Perch weighing 2 lbs. 5 oz. caught by Mr. H. Dorant in the Kennet at Newbury.

A Perch weighing 2¼ lbs. caught in the Kennet at Newbury.

A Perch weighing 2½ lb. caught by Mr. R. Freeman in the Kennet near Newbury.

A Dace wighing ¾ lb. caught by Mr. T. Watkins in the Kennet near Newbury.

891. **MACNEE, JAMES,** Loch Tummel Side, Pitlochry, Perthshire.
Case of Stuffed Loch Tummel Trout. (12 specimens from a maximum weight of 5½ lbs.)

892. **MAIDENHEAD, COOKHAM AND BRAY THAMES ANGLING ASSOCIATION,** Skindle's Hotel, Maidenhead.
Stuffed Specimens of Thames Fish.
Pike, 19 lbs., lent by Mr. A. Brinkman.
Trout, 10 lbs., lent by Mr. A. Brinkman.
Trout, 7 lbs., lent by Mr. A. Brinkman.
Chub, 4¾ lbs., lent by Captain W. J. Casberd-Boteler, R.N.
Trout, 7 lbs., lent by Mr. W. C. Haynes, R.N.
2 Perch, 1 Tench, Perch 2½ and 2¼ lbs., Tench 2 lbs., lent by Mr. R. Nicholson.
Jack, 20 lbs., lent by M., C., and B., Thames Angling Association.
Jack, 13 lbs., lent by M., C., and B., Thames Angling Association.
Chub, 5¼ lbs., lent by Mr. Spencer.
Trout, 9 lbs., lent by Mr. Worboys.
Chub, 5 lbs. 10 oz., lent by Mr. Worboys.
Perch, 3 lbs. 10 oz., lent by Mr. Speechley.
Trout, 8 lbs., lent by Mr. H. Wilder.
Trout, 7 lbs., lent by Mr. H. Wilder.
Chub, 4¼ lbs., lent by Mr. H. Wilder.

*"LAND AND WATER" says—*

"Messrs. BENJAMIN'S Establishment is quite a Tailoring Museum. Sportsmen and Sportswomen in particular can find everything here in the way of Sporting and Outdoor Apparel."

*ULSTER* HOUSE, CONDUIT STREET, W.

**MAIDENHEAD, COOKHAM AND BRAY THAMES ANGLING ASSOCIATION**—*continued.*

Jack, lent by Mr. J. A. Lewis.
Jack, lent by Mr. J. A. Lewis.
Trout, lent by J. A. Lewis.
Jack, 16½ lbs., lent by Mr. W. B. Lethbridge.

**MANN, THOMAS JAMES, Esq.**, The Grange, Bishops Stortford, Herts.

A Salmon Head, female, taken by rod and line.
A Roach, weighing 2 lb. 1½ oz., from the Test.
A Cast of a Grayling, 2¾ lbs., from the Test.

**MASTIN, WALTERS WALKER**, for P. R. F. Warwick, Digby, Sleaford.

1 Case Stuffed Pike, caught at Culverthorp, by Rev. H. Manton (Deceased).

**MATTHEWS, EDWARD DAVID**, Member of the "West London Angling Club," Windsor Castle Hotel, Hammersmith.

1 Preserved Roach in Case, 2 lbs.

**MATHEWS, STAVERTON**, 105 Great Russell Street, London.

Stuffed Pike in Case, caught in the Shannon spinning by Mr. Staverton Mathews, 26th Sept., 1878 (weight 35 lbs.)

**MAUDE, C. J.**, Royal Mews, Hampton Court.

Three Cases of Stuffed Carp, killed in Home Park, Hampton Court, weights, 12 lbs., 11¼ lbs., and two of 12¾ lbs.

**MOORE BROTHERS**, 36 Newsham Drive, Newsham Park, Liverpool.

Skeleton of Wolf Fish, also skulls of Wolf Fish, Halibut, Hake, &c., disarticulated and separable for purposes of study and comparison.
Skeleton of a rare young Crocodile, and skeletons of young Alligator and young Edible Turtle, disarticulated and separable for purpose of study and comparison.

**MORGAN, JAMES WHISSON**, 277 Amhurst Road, Stoke Newington, N.

3 Barbel in one Case. Total weight when caught (as certified) 22 lbs., 15 ozs. (by Isaac Walton Club).

INDIA-RUBBER DECK BOOTS
*OF EVERY SIZE AND DESCRIPTION.*
**ANDERSON, ABBOTT, and ANDERSON,**
*87, QUEEN VICTORIA STREET, LONDON, E.C.*

900. **MYDDELTON, SIR HUGH, ANGLING SOCIETY,** Empress of Russia, St. John's Road, Clerkenwell, E.C.
1 Stuffed Tench, 4 lbs. 6 oz.
1 Stuffed Tench, 3 lbs.
1 Stuffed Trout, 3 lbs.
1 Stuffed Chub, 3 lbs. 8 oz.

901. **NALTY, T. E.,** 46 St. German's Road, Forest Hill, S.E.
A Stuffed Perch in Glass Case, taken on Oulton Broad, near Lowestoft, on August 27th, 1877, by the Exhibitor, with four smaller Perch, weighing respectively ¾ lb., 1 lb., 1 lb., and 1 lb. 2 oz. Specimen Perch 2 lbs. 7 ozs., total weight 6 lbs. 5 oz., taken in less than thirty minutes.

901a. **NESTOR, AUGUSTINE,** 33 George Street, Limerick.
Large Brown River Trout, weight 20 lb. 13 oz.

902. **NORTH-WESTERN ANGLING CLUB,** W. Hillier, Secretary, "Lord Southampton," Maitland Park, Haverstock Hill, N.W.
9 Cases of Pike.
3 Cases of Chub.
3 Cases of Bream.
3 Cases of Roach.
3 Cases of Perch.
1 Case of Carp.
1 Case of Reed.
1 Case of Shalon.

903. **NUTTING & CO.,** Fishing Rod and Tackle Manufacturers, 70 Edgbaston Street, Birmingham.
Carp in Glass Case, weighing 18½ lbs., caught by Mr. J. Eales, Warwick.
Roach in Glass Case, weighing 3½ lbs., caught in Soho Pool, Birmingham, by Mr. Jones.

904. **NUTHALL, ALFRED,** Thames Street, Kingston.
Stuffed Carp, taken in the Thames, weight 14 lbs. 10 ozs.

Stuffed Carp, taken in Home Park, when spinning for pike.

905. **PENNELL, H. CHOLMONDELEY-,** 5, Cadogan Terrace, S.W.
Cast of Salmon, weighing 53 lbs., taken in the Avon at Christchurch, April 3, 1880, and stated to be the largest caught

Waterproof Aprons, Trousers, and Petticoats for
GUARANTEED.
PUNT FISHING.
MAKERS—
37, Queen Victoria St., E.C.
ANDERSON, ABBOTT, & ANDERSON.

**PENNELL, H. CHOLMONDELEY**—*continued.*

in that river within memory. It was presented to their Parliamentary candidate, John E. Edwards-Moss, Esq., by his supporters, and the cast now exhibited was taken by Mr. Searle.

Pictures of Fish.

These pictures are taken from specimens procured from the localities most celebrated for the particular species, and are literally drawn to "scale." They are examples of the illustrations of "British Sporting Fish," about to be published by the exhibitor.

**PICKHARDT, G.**, Working Naturalist, 45 Crogsland Road, London, N.W.

A mixed Collection of Stuffed Fish, Reptiles, Birds hostile to Fish, and Mammalia detrimental to Fish, all in two glass cases.

**PUGH, ROBERT L.**, 16 Comeragh Road, West Kensington, W.

Thames Trout.
Perch from Kennet.
Perch from Thames.
Barbel from Thames.
Jack from Thames.
Chub from Thames.
Tench from Thames.
Dace from Thames.
Dace from Kennet.
Pope from Thames.

**READING AND DISTRICT ANGLING ASSOCIATION**, Great Western Hotel, Reading.

Cast of Salmo Fario, in show case, caught at Reading, April 1880, and presented to H. M. the Queen. The cast prepared by the late Frank Buckland. Weight 16 lbs. 15 oz.

**PISCATORIAL SOCIETY.**

Collection of Specimen fish.

**ROBERTS, THOMAS**, Castle Meadow, Norwich.

One Case with small Pike and Roach.
One case with small Pike and Water Rail.

*ANDERSON, ABBOTT, & ANDERSON'S*
**FISHING TROUSERS**
**Are unequalled for Quality, Finish and Wear.**
37, QUEEN VICTORIA ST., LONDON, E.C.

911. **ROBINSON, A., & LOWIN, B. J.**, Edmonton and Tottenham Angling Society, Upper Edmonton, Middlesex.
Perch, 4 lbs. 4 oz.
Pike, 4 lbs.

912. **SACHS, ALICE**, 22 Hyde Park Place, London, W.
Three Dresden China Figures.
A Crystal Perch Locket.
A Case of Stuffed Fish.
A Fishing Rod.
Oil Painting of a Salmon and a Cat.
Case of Salt-Water Fish.

913. **SACHS, FLORENCE**, 22 Hyde Park Place, London, W.
Circular Model of Three Trout. (By the late Frank Buckland.)

914. **SACHS, THOMAS RANSOM**, 22 Hyde Park Place, London, W.
Twenty Glazed Cases, containing Stuffed Fish, Trout, 2 lbs. to 12 lbs., Fresh Water Herring, Char, Knife Fish, Pike, Perch, 4½ lbs., Perch 3¾ lbs., 2¾ lbs., Bream, 6 lbs., Pike, 24 lbs., American Striped Bass, and Black Bass.

915. **SAYER & CO.**, 100 Lower Thames Street and Billingsgate, London.
Three Cases of Stuffed Fish.

916. **SCOTT, J. R. KNOWLE**, F.S.A., The Drive, Walthamstow.
Specimen of Large Pike, in glass case, caught with a rod at Avon Tyrrell, in Hants, in the River Avon, weight 32 lbs., 3 feet 8 inches in length by 28 inches in extreme girth.

917. **SEARLE, EDMUND WILLIAM**, 11 College Place, Great College Street, N.W.
53 lb. Salmon, cast and painted to life.
17 lb. Thames Trout, in case, cast and painted to life.
Group of 15 Common Trout, in case, cast and painted to life.
2 large 6 lb. Soles, cast and painted to life.
Dish of Sea Trout caught at London Bridge, cast and painted to life.

**ANDERSON, ABBOTT, & ANDERSON'S**
**FISHING BROGUES**
**Are Unsurpassed.**
37, Queen Victoria Street, London, E.C.

**EARLE, EDMUND WILLIAM**—*continued.*
Dish of Common Trout, cast and painted to life.
Large 3 lb. Lampern, cast and painted to life.
Several small Salmon, cast and painted to life.
5 2 lb. Perch, cast and painted to life.
2 Mackerel, 1 lb. and 2 lbs., cast and painted to life.
Grayling, cast and painted to life, and various other castings

**MITH, D.,** 16 Guildford Street, Wilmington Square, Clerkenwell.
2 large Perch, weight 3 lbs. 12 oz., taken at Amberley.
3 large Perch, River Colne.
1 Carp, River Wey.
1 Roach, weight 1 lb. 14½ oz., taken at Amberley.
1 Roach, weight 1 lb. 13½ oz., taken at Amberley.

**NOWE, HUGH, & SONS,** Church Street, Inverness.
Salmo Ferox Trout taken in River Ness. 29½ lbs. In glass case.
Salmo Ferox Trout taken in Loch Ness. 7½ lbs. In glass case. Killed with a Minnow.
Gillerow Trout killed by the late Duke of Leeds at Applecross. Weight 10 lbs. On stand.

**OCIETY OF CAXTONIAN ANGLERS, THE,** Falcon Hotel, Gough Square, Fleet Street.
1 Case 3 Bream.
1 Case 3 Bream.
1 Case 2 Jack.
1 Case 1 Jack.
1 Case 2 Bream.
1 Case 1 Barbel.
1 Case 1 Chub.
1 Case 1 Jack.
1 Case 1 Jack.
1 Case 1 Bream.
1 Case 1 Carp.

**OMAN, PHILIP,** Argus Office, Norwich.
Stuffed Specimen of Chub, caught on a single hair line at Maidenhead, weight 4 lbs. 4½ oz.

ANDERSON, ABBOTT, AND ANDERSON
ARE THE MANUFACTURERS OF THE
ARMY REGULATION VALISE.
37, Queen Victoria St., London, E.C. Works: Limehouse.

Messrs. Anderson, Abbott & Anderson, [COPY.] Horse Guards, 12th June, 1871.
The Valise made by your firm has been found well suited for the conditions proposed, viz., to enable an officer to carry the articles absolutely required for service; and the waterproof sheet answers as a bed; the whole, fittings included, not exceeding forty pounds weight. The pattern has been deposited at the Horse Guards for inspection.—Arthur Herbert, A.A.G., Col.

922. **SQUIRE, FREDERICK W. W.**, 13 Radnor Place, Plymouth.
A large preserved Specimen of Cornish Brown Trout (Salmo faris), weight 5 lbs. 10 oz.

923. **STANLEY ANGLERS' SOCIETY**, 51 Camden Park Road, N.W. Geo. E. Walker, Hon Sec.
A Collection of Stuffed Fresh-Water Fish.

924. **STARKEY, JAMES**, 28 Albion Road, Stoke Newington.
Case of Ten Roach, united weights 16 lbs.
Case of One Carp, weighing 5 lbs. 2 oz.
Case of One Chub, weighing 5 lbs. 11 oz.
Case of Two Tench, weighing 4 lbs. 6 oz.
Case of Two Perch, weighing 4 lbs. 6 oz.
Case of One Trout, weighing 8 lbs. 7 oz.
Case of One Trout, weighing 7 lbs. 12 oz.
Case of Two Trout, weighing 9 lbs. 2½ oz.
Case of One Bream, weighing 8 lbs. 7 oz.
Case of One Bream, weighing 4 lbs.
Case of One Jack, weighing 10 lbs.
Case of One Jack, weighing 12½ lbs.
Case of One Jack, weighing 13 lbs.
Case of One Jack, weighing 17½ lbs.
Case of One Roach, weighing 2¾ lbs.
Case of Two Trout from the River Leader.

925. **SOUTH LONDON ANGLING SOCIETY,**
Cases of Stuffed Freshwater Fish.

925*a*. **SWEETING, JOHN, & CO.**, 158, 159 Cheapside, London, E.C.
Small Sturgeon.
Irish Trout.

926. **TAPLIN, F.**, Wimbledon.
2 Carp in Case, each weighing about 13 lbs., not caught by Exhibitor.
Carp in Case, weighing 13½ lbs.

927. **TAYLOR, GEORGE GALLOWAY,** 11 Tranton Road, Jamaica Road, Bermondsey, S.E.
Chub, weight 7 lbs., caught in the Thames on the 14th August, 1881, said, by the papers at the time, to be the largest preserved in the United Kingdom.

ANDERSON, ABBOTT, AND ANDERSON'S
PATENT TANNED CANVAS RUBBER-LINED FIRE HOSE.
AS SUPPLIED TO THE LONDON METROPOLITAN FIRE BRIGADE.

From the "TIMES," Dec. 5th, 1879.—"Yesterday the leathern hose of the Metropolitan Brigade was given up in favour of a New Tanned-Canvas Hose lined with India-Rubber, about 80,000 ft. of which has been manufactured for the Brigade by the Inventors, Messrs. ANDERSON, ABBOTT, and ANDERSON. The new hose was tested up to [illegible] pressure on the square inch, and, with the exception of one short length, all was accepted. The new hose has the advantage of being waterproof, and can convey water through a warehouse or room without damage by leakage to the goods. It is claimed for it that it is cheaper, lighter, and stronger than leathern hose, will not require so much labour to convey it to the hydrants, does not need dressing to keep it in order as leather does, and is not so liable to be burnt. Captain Shaw was yesterday present at the testing of the hose, and expressed himself perfectly satisfied with the new material."

37, QUEEN VICTORIA STREET, E.C., LONDON, ENGLAND.

. **TAYLOR, MATTHEW,** Cookridge Street, Leeds.
One Show Case, containing coloured casts from fish (chiefly fresh water fish).

. **TOPPIN, PERCY,** Glan-yr-Afon, Strawberry Hill.
Two Cases of preserved fish "Bull Trout," weight 27 lbs. and 30½ lbs. each, caught by Exhibitor while Salmon fishing and with flies of his own make. The fly which caught the larger fish was lost with a heavy fresh new salmon estimated at over 40 lbs. weight, after a most exciting fight in the same pool half an hour later.

. **TREMAINE, WILLIAM HENRY,** Member of the West London Angling Club, Windsor Castle Hotel, Hammersmith.
One Preserved Pike, weight 21 lbs., in Case, caught in the River Ouse.

. **UNITED SOCIETY OF ANGLERS (THE),** The "Wellington," Shoreditch, E.
Loan Collection of Stuffed Freshwater Fish, 80 cases.

2. **EDINBURGH, H.R.H. THE DUKE OF, K.G.,** Clarence House, St. James's, London.
Pike, 28 lbs.

3. **VALE, JOHN,** 27 Hammersmith Road, London, N.W.
Two Cases, containing Pike, weight 27 lbs., caught by Rod and Line. The thickness of the back of the Pike is something extraordinary; was caught "spinning" in the adjoining lake to Virginia Water, in Windsor Park.
Thames Trout, weight 7 lbs., caught at Maidenhead.

4. **WEBB, T. S.,** 56 Burton Street,' Burton Crescent, London. Member of King's Cross United Angling Society.
1 Trout, 16 lbs. 5 oz., in Bent Case, taken by rod and line, New River.
2 Trout, 8 lbs. 9 oz., and 6 lbs. 12 oz., in Square Case, taken by rod and line, River Lea.

35. **WEBSTER, WILLIAM GEORGE,** 1 Bedfort Court, Old North Street, Red Lion Square, W.C.
Two Stuffed Roach, in Case, 4 lbs. 3 oz., taken at Amberley.
One Stuffed Roach, in Case, 2 lbs. ½ oz., taken at Amberley.

ANDERSON, ABBOTT, & ANDERSON'S
*GUARANTEED*
DRIVING WATERPROOFS
*FOR*
COACHMEN AND FOOTMEN.

**WEBSTER, WILLIAM GEORGE**—*continued.*

One Stuffed Roach, in Case, 1 lb. 9½ oz., taken at Amberley.
One Stuffed Roach, in Case, 2 lbs. ¼ oz., taken at Amberley.
Two Stuffed Roach, in Case, 3 lbs. 5 oz., taken at Amberley.
One Stuffed Roach, in Case, 1 lb. 2¾ oz., taken at St. Margaret's.
Tablet, with Particulars of Fish.

936. **WESTBOURNE PARK PISCATORIAL SOCIETY, THE,** The Pelican, All Saints' Road, Near Westbourne Park Station, London, W. H. Thompson, Secretary.

Pike in Case 26 lbs., from private water.
Pike in Case, taken in Grand Junction Canal.
Trout in Case, Thames.
Barbel in Case, Thames.
Carp, Welsh Harp.
Carp, Welsh Harp.
Bream Ouse.
Chub, Colne.
Pair of Tench, private water.
Perch, Kennet.
Roach, Colne.
Roach, Colne.
Dace, Colne.
All fish taken angling.

937. **WOODALL, CHARLES,** The Albion, Albion Street, W.

Collection of Stuffed Fish.

938. **WOODMAN, G.,** Vice-President of the Junior Piscatorial Society, 60 Camberwell New Road.

1 Case of Rudd, caught with rod and line.
4 Rudd, all over 2¼ lbs. each.

939. **WRIGHT, ROBERT,** The Willows, Harlesden, Middlesex.

A Grayling in Case, weight of fish, 3 lbs., caught with fly.

940. **WYNN, SIR WATKIN W., Bart, M.P.,** Wynnstay, Rhuabon.

Specimens of Stuffed Fish called Gwynyad from Bala Lake, North Wales.

GENTLEMEN'S
VENTILATED WATERPROOFS
*In Tweed, Cashmere, Gossamer, and other Materials.*
ANDERSON, ABBOTT, AND ANDERSON,
**37, Queen Victoria St., London, E.C.**

1. **FITZGERALD, MAJOR PUREFOY,** North Hall, near Basingstoke.
   Stuffed Pike, caught at Eptone House, Edge Hill, in an old monastic pond; length, 4 ft. 1 in.; circumference, 2 ft. 5 in.; weight, 40 lbs.

2. **GARDNER, JAMES,** 29 Oxford Street, London, W., Show Rooms, 149 Oxford Street, W.
   Collection of Stuffed Fish, consisting of various Fresh and Salt-Water Fish, Molluscs, &c.

3. **BRAINE, FRANK,** Kensington.
   Specimen Fish.

4. **RUSHBROOK, G.,** 4 Ainger Road, Primrose Hill, N.W.
   A Show Case with Fish, preserved by a new process.

5. **SCOTT, HARRY,** Forbes House, Surrey, 28 Belgrave Square.
   Cast of Salmon, weighing 43½ lbs., caught with fly on the Culter House Water, Dee, Aberdeenshire, by H. Scott, and painted by Mr. Searle at the house and under the personal supervision of the late Mr. Frank Buckland.

6. **WEBB, JOHN W., CAPTAIN R.N.,** Kongo House, Hythe.
   A very large Snout of Sword-Fish, obtained at Singapore; the fish was probably caught in the Straits of Malacca, and it is believed to be larger than any in the British Museum.

7. **ADAMS, W. A.,** Gaines, Worcester.
   Stuffed Pike.

8. **BURTON & SON, H. J.,** 191 Wardour Street, Oxford Street, London.
   Group of Saw-fish snouts. Also a large stuffed specimen of the Sturgeon, and Crocodile Head.

9. **CROWLEY, J. W.,** 28 Cloudesley Square, Islington, N.
   Case of four Barbel, weight 27 lbs. 1 oz.

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## Division LII.

(l) Reptiles, such as tortoises, turtles, terrapins, lizards, serpents, frogs, newts, &c.

50. **SMITH, GEORGE,** Salford Street, South Heigham, Norwich.
    1 Case of Frogs.

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ANDERSON, ABBOTT, & ANDERSON,
MANUFACTURERS OF THE BEST
OILSKIN CLOTHING FOR SEA AND LAND PURPOSES;
Also Oilskin Horse Clothing, Cart and Rick Covers, and their Celebrated Patent Waterproof Cloth for Covering, Driving and Carriage Aprons, &c., &c.
(*Copy of Testimonial.*) HOME OFFICE, *Sept.* 3, 1878.
Messrs. ANDERSON & Co.—You made me an Oilskin Coat about seven years ago, which has lasted in capital condition until this year. (Signed) A. F. O. LIDDELL.

951. **BUTT, GEORGE F.**, 49 Wigmore Street, London, W.
Indian Crocodile (C. bombifrons) stuffed in case, in the act of seizing a Leopard (Felis Leopardus) while drinking.

953. **BURTON & SON, H. J.**, 191 Wardour Street, Oxford Street, London.
Turtle Shells.

954. **ZOOLOGICAL SOCIETY**, Hanover Square, London, W.
Greater Black-backed Gull (*Larus marinus*).
Lesser Black-backed Gull (*Larus fuscus*).
Herring Gull (*Larus argentatus*).
Common Gull (*Larus canus*).
Black-headed Gull (*Larus ridibundus*).
Gannet (*Sula bassana*).
White Pelican (*Pelicanus onocrotolus*).
Flamingo (*Phœnicopterus antiquorum*).
Bar-tailed Godwit (*Limosa lapponica*).
Cormorant (*Phalacrocorax carbo*), by Capt. Salvin.
One or two Water Tortoises or Terrapins.
Crab-eating Racoon (*Procyon cancrivorus*).
Coypu Rat (*Myopotamus coypus*).
Common Seal (*Phoca vitulina*), by the Committee.
Beavers (*Castor canadensis*), by the Marquis of Bute.

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## Division LIII.

(*m*) Aquatic and other birds hostile to fish or fishing

955. **ASHMEAD, G. B., & CO.** (Naturalists), 35 Bishopsgate Street, London, E.C.
Marine Fish-feeding Birds. Divers Cormorant, Shag, &c. (British).
Aquatic Fish-feeding Birds. Heron, Bittern, &c. (British).
Small groups, anecdotal, illustrating vicissitudes of bird and fish life; also preserved bird skins, from which artificial flies used in fishing are formed.

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*ANDERSON, ABBOTT, and ANDERSON'S*
INDIA-RUBBER MATS.
VERY SUITABLE FOR
SHIPS, YACHTS, STEAMERS, CARRIAGES, ETC.

**BRUNTON, JOHN,** M.A., M.D., 21 Euston Road, London, N.W.
Stuffed Grebe.
Specimen of Podiceps Minor, or lesser Grebe, caught when fly-fishing for Grayling, took the fly, and was landed on single horse-hair cast.

**BURROUGHS, Lieut.-Gen. F. W. TRAILL,** C.B., Rousay, Orkney, N.B.
Two Stuffed Wild Swans shot in Rousay, Orkney, N.B.

**CARELESS, GEORGE DYER,** 52 Arundel Street, Landport, Portsmouth.
Case of Sea Bird and Iceberg.

**EEDLE, THOMAS,** 40 Goldsmith Row, Hackney Road.
Birds injurious to Fish—
Gooseanders.
Kingfishers.
Dippers—Birds beneficial to Fish.

**FRASER, SIMON,** 11 Huntly Place, Inverness, N.B.
Glass Case of Aquatic Birds, general.
Case of Birds in act of destroying Trout in artificial water.

**GUNN, T. E.,** 47 St. Giles Street, Norwich.
Collection of Stuffed British Birds hostile to fish and fishing contained in about 40 cases, including fine, specimens of the Osprey, Kingfishers, Herons, Night Heron (very rare), Bitterns, White Stork, Egret, Spoonbill, Water Hen, Coot, Shielducks, Shovellers, Scoters, Smew, Goosander, Meyauser, Great Crested and other Grebes in summer and winter. Divers, Guillemots, Razorbill, Little Auk, Puffin, Cormorant, Gannet and various species of Terns and Gulls, nearly all collected in Norfolk, and mounted in groups illustrative of different seasons, and also some remarkable incidents in Aquatic life, the whole forming a representative series of British Fish-Eating Birds.

**HELSTRIP, C.,** 13 St. Saviour's Place, York.
Osprays and Fish.
Lille Egret.

*ANDERSON, ABBOTT, & ANDERSON'S*
IMPROVED FISHING BAGS.
STRONG AND WELL MADE.
**37, Queen Victoria St., London, E.C.**

**HELSTRIP, C.**—*continued.*
Darters.
Night Herons.
Ruddy Sheldrake and Duck.
Wild Duck and Drake.

963. **HODGES, W. J.**, Aucuba Villa, Lavender Hill, S.W
Gannet or Solan Goose.
Heron.
Black-throated Diver (winter plumage).
Green Cormorant.
Great Black-backed Gull.
Herring Gull.
Herring Gull (immature).
Common Gull.
Red-legged Gulls (winter plumage).
Red-legged Gulls (winter plumage).
Guillemots.
Razor-bill.
Puffins.
Oyster Catcher.
Curlew.
Curlew.
Curlew.
Whimbrel.
Grey Plovers (winter plumage).
Bar-tailed Godwits.
Greenshanks.
Greenshank.
Redshank.
Spotted Redshank.
Stints.
Teal (female).
Green Plover.
Sandwich Tern.
Little Tern.
Sooty Tern.
Common Tern.

964. **HOWLETT, W.**, High Street, Newmarket.
5 Cases Birds hostile to fish :—
1 Case with two Birds, Purple Herons.

**ANDERSON, ABBOTT, & ANDERSON'S**
**FISHING STOCKINGS**
**ARE GUARANTEED ABSOLUTELY WATERPROOF.**
**37, Queen Victoria Street, London, E.C.**

**HOWLETT, W.**—*continued.*
1 Case two Birds, Common Heron.
1 Case one Bird, Gannet.
2 Cases of Kingfishers, two Birds in each case; all shot on Norfolk and Suffolk Coast.

**JARDINE, ALFRED GEORGE,** 38 Old Change, London.
Case of Birds. Red Throated Divers. Winter Plumage.

**ROBERTS, THOMAS,** Castle Meadow, Norwich.
Cases of Stuffed Aquatic Birds.

**SACHS, THOMAS RANSOM,** 22 Hyde Park Place, London, W.
Two Cases, containing German and English Kingfishers.

**SNOWIE, HUGH, & SONS,** Church Street, Inverness.
Male and Female Great Northern Diver. 16 lbs.
Two Cormorants. 18 lbs.
One Black-throated Diver. 7 lbs.

**BURTON, H. J. & SON.,** 191 Wardour Street, Oxford Street, London.
Case of Ducks, stuffed and mounted.
Case of Waders, stuffed and mounted.
Case of Ducks, stuffed and mounted.
Group of 2 Common Terns in glass shade.
Case of Sea-fowl, stuffed and mounted.
Case of Water-fowl stuffed and mounted.
Case of Gannets (adult and young birds), stuffed and mounted.

Case of Waders, stuffed and mounted.
Case of Cormorants, stuffed and mounted.
Case of Cormorants, stuffed and mounted.
Glass Show Case of Aquatic Bird Skins.

**BUTT, GEORGE F.,** 49 Wigmore Street, London, W.
Contest between two Osprey (Pandion haliœtus) or Fish Hawks, over a Lump Fish (Cyclopterus lumpus), in case.

Two white Spoonbills (Platalea Leucorodia) at rest, with marine accessories—fish, &c.—in case.

**ANDERSON, ABBOTT, & ANDERSON'S**
**PATENT TANNED CANVAS RUBBER-LINED FIRE HOSE.**
*SUPPLIED TO ALL PARTS OF THE WORLD.*
Guaranteed Pressure, 300-lbs. to the square inch.
**37, QUEEN VICTORIA STREET,**
LONDON, ENGLAND.
*Prices, Samples, and Opinions of the Press on application.*

971. **COOKE, T., & SON,** Naturalists, 30, Museum Street, W.
Case of Kingfishers.
Mahogany Case of 2 Divers.
Case with Heron.
Case with Gannet.
Two Cases of Eggs.

972. **GARDNER, JAMES,** 29 Oxford Street, London, W., Show Rooms, 149 Oxford Street, W.
Collection of Aquatic Birds, consisting of various species of Herons, Gulls, Divers, Ducks, Pelicans, Storks, Cranes, Albatross, Grebes, &c.

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## Division LIV.

(*n*) Aquatic and amphibious mammalia (otters, seals, whales, &c.) and others detrimental to fish.

973. **ASHMEAD, G. B., & CO.** (Naturalists), 35 Bishopsgate Street, London, E.C.
Marine Mammals. Seal.
Aquatic Mammals. Otter.

974. **CARR, WALTER PATERSON,** High Street, Berwick-on-Tweed.
An Otter (stuffed), caught along with salmon in net in River Tweed.

975. **EASTWOOD, G. J.,** Cheshunt, Herts.
Otter, shot in the Exhibitor's private fishery, weight 13½ lbs.

976. **EEDLE, THOMAS,** 40 Goldsmith Row, Hackney Road, London.
Otters and young.

977. **EYRE, HENRY BINFORD,** Elgin Lodge, Weybridge.
Bitch Otter and Young in glass case.
Dog Otter in glass case.
Bitch Otter with Fish in glass case.

978. **FRASER, SIMON,** 11 Huntly Place, Inverness, N.B.
Seal in act of destroying Salmon, in case.
Case with Otter in act of destroying Trout.

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**ANDERSON, ABBOTT, AND ANDERSON'S**
**FISHING HATS AND SOU'-WESTERS**
**ARE THE BEST.**
**37, QUEEN VICTORIA STREET, LONDON, E.C.**

9. **GUNN, T. E.**, 47 St. Giles Street, Norwich.
Two groups of Stuffed British Otters are shown as aquatic animals detrimental to the fishing interest.
"At Bay" represents a fine dog of 26 lbs. weight, with a roach of 2¼ lbs. under its foot, and its alarmed young ones around; is supposed to have been tracked to its home by the hounds.
"Night Poaching" shows a brace of otters, regaling themselves upon the finny inhabitants of a trout stream.

A Small Case, containing a Baby Otter, about two days old, taken near Norwich.

9a. **PUGH, ROBERT L.**, 16 Comeragh Road, West Kensington, W.
Otter from Thames.

9b. **ROBERTS, THOMAS**, Castle Meadow, Norwich.
One Case, Pair of Otters and Fish.

9c. **SINCLAIR, GEORGE**, Ollaberry, Shetland, N.B.
Dried, Dressed Otter Skin.

10. **HELSTRIP, C.**, 13 St. Saviour's Place, York.
Otters and Fish.

11. **WILLIAMS, ALEXANDER**, 97 Victoria Road, Dundee, Scotland.
1 Large Walrus.

11a. **NEWBURY ANGLING ASSOCIATION.**
Otters from the Kennet.

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## Division LV.

**Works of ichthyology. Maps illustrating geographical distribution, migration, &c., of fishes and spawn.**

12. **DAY, Dr. FRANCIS**, Leamington House, Cheltenham.
2 Vol. 4to., Fishes of India.
6 No. 8vo., Fishes of Great Britain.
2 Vol. 8vo. Fish and Fisheries of India.
1 Vol. 4to., Fishes of Yarcand.

The Best and Cheapest. First Established 1825.
NEAVE'S FOOD FOR INFANTS AND INVALIDS.
IN ONE-POUND ONE SHILLING CANISTERS.
SOLD EVERYWHERE. WHOLESALE OF THE MANUFACTURERS,
J. R. NEAVE & Co., Fordingbridge, England.

983. **HARDING, CHARLES W.**, Assoc. M. Inst. C.E., King's Lynn, Norfolk.
A Report on the Smelt Fisheries of the River Ouse to the Corporation of King's Lynn.

984. **HOUGHTON, REV. WILLIAM**, M.A., F.L.S., Preston Rectory, Wellington, Shropshire.
Book, in two Volumes, title, "British Fresh Water Fishes."

985. **LAUGHRIN, WILLIAM**, Polperro, Cornwall.
A paper on the growth of Barnacles on ships' bottoms and logs of wood found floating on the ocean.

986. **QUARITCH, BERNARD**, 15 Piccadilly, London.
Illustrations of the Salmonidæ, by Sir William Jardine, twelve coloured engravings, in twelve frames.

Illustrations' of Fresh Water Fishes, by Louis Agassiz, twenty coloured engravings, in twenty frames.

Catalogue, or description of the above, in two frames.

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DIVISION LVI.

**Specimens and representations illustrative of the relations between extinct and existing fishes.**

988. **DAMON, ROBERT**, 4 Pultney, Weymouth.
Fossil Fishes, many generic forms now extinct.

989. **GALLOWAY, WILLIAM**, Inveresk by Edinburgh.
Collection of various interesting objects from a pre-historic shell-mound, in the island of Oransay, Western Hebrides. This shell mound is situated on the old coast line, and dates undoubtedly from a period anterior to its elevation. No trace of metals have been found, but the occurrence of numerous flint chips, &c., carry it back evidently to the neolithic age. Of objects, showing unmistakable traces of human use and agency, there are ten fish-spear or harpoon heads of bone, and one butt; also numerous rubbed bones, chisels, borers or awls, and picks of the same material. Also

WATERPROOF FISHING COATS,
TO SHORTEN AT PLEASURE, AND WITH INNER CUFFS TO PREVENT WATER RUNNING UP.
**ANDERSON, ABBOTT, & ANDERSON,**
**37, Queen Victoria Street, London, E.C.**

**GALLOWAY, WILLIAM**—*continued.*

lap and hammer-stones, rubbed stones, limpet hammers, &c. Also two shell spoons, for use in the left hand, pierced for suspension, &c. In addition to the usual edible shellfish, the shells of which occur in large quantities, there are also remains of the Rorqual, Seal, Red Deer, Otter, and other mammals of the Mullet, Wrasse, picked Dogfish, Skate, &c. Among the aquatic birds are included bones of the now extinct Great Auk, the Wild Swan, Razorbill, Guillemot, &c., forming one of the most important discoveries of this kind made in Scotland.

Various relics from a Viking grave in Kiloran Bay, Colonsay. This grave was accidentally discovered by Malcolm McNeill, Esq., June 1882, and, from the number of clinker-nails or rivets found, has evidently been a ship-burial. In addition to human remains, there were found iron weapons, very much oxidised, including a sword, spear, and battle-axe; also remains of a shield, iron pot, &c. Portions also of a bronze belt, bronze pin, and a very perfect set of scales and weights, &c.

**GERRARD, EDWARD, JUN.**, 31 College Place, Camden Town.

Skeleton of Cod.
Skeleton of Maigre or Royal Fish.
Skeleton of Ceratodus Forsteri.
Skeleton of Hake.
Disarticulated Cod's Head.
Tortoise Skeleton.

**GREGORY, JAMES R.**, 88 Charlotte Street, Fitzroy Square, London.

Collection of Fossil extinct British Fishes, with names, geological formations, and localities.
Collection of Fossil Teeth of extinct British Fossil Fishes, with names, geological formations, and localities.

**NICHOLS, EDWARD**, Market Place, Norwich.

Jaw Bones and teeth of Roach, caught and mounted by Exhibitor.

**MANTUA, THE PRINCE OF.**

Collection of Fossil Fishes.

**ANDERSON, ABBOTT, & ANDERSON'S**
FISHING BROGUES
**Are Unsurpassed.**
37. Queen Victoria Street, London, E.C.

## History and Literature of Fishing—Fishery Laws—Fish Commerce.

The history and literature of fish and fisheries form in themselves a veritable ocean, the inhabitants of which are of the most varied nature, from the chatty pages of Walton to the useful but scarcely inviting Tables of Parliamentary Statistics. This voluminous treatment may occasion surprise to persons unacquainted with the extent and intricacy of the subject; but its cause will be readily perceived by any one who considers the complexity of the relations involved, as well as the multiplicity of species and properties. Not merely do fish afford one of the chief staples of human food, but they are the only denizens of the element which covers by far the greater portion of the earth's surface. When to these considerations it is added that they are apparently quite incapable of domestication, that some of the finest sorts soon dwindle and die out unless a perfectly free course be opened to them through river and ocean, that their capture is the source of innumerable jealousies, and that physical means can scarcely be devised for protecting piscatorial rights whether vested in communities or individuals, the wonder arises not that so much has been written, but rather that there should be any end to controversy. Fishing, whether for business or pleasure, is considered by English people, and indeed by mankind in general, as primarily a pursuit in which all the world may engage wherever, whenever, or however they please; and the only limitations to its exercise have their origin either in a defective right of access to the waters or in the necessity to preserve a continuance of supply. Thus on the high seas every one may catch whatever fish they can with whatever means they are able to employ, so long, of course, as they do not interfere with the superior right of navigation. On the other hand, it is clear that when a coast is approached, certain rights over the adjacent waters must naturally belong to the people of the country; so that foreigners cannot exercise their occupation within some conventional distance (three miles from low-water mark in the point determined) without license from the Government. Hence arises immediately the necessity for international agreement, and one of the earliest conventions between Great Britain and the newly acknowledged American States, had regard to the fisheries of Newfoundland. Direct piscatorial rights, too, are by no means the only objects of diplomatic intervention in these matters; and not many years have elapsed since the position of seamen in distress, and the distribution of their estates, when deceased, became regulated by Treaty between our own Government and those respectively of Germany and Italy. Rivers, again, in so far as they are navigable, are open to all natives of the country through which they run; but where access can only be obtained from the banks, both they and the fish contained in them are considered to belong to the riparian proprietors. Angling, it may be here observed, stands upon precisely the same footing as net fishing, except that the open season is protracted for a short time in order to balance in some degree the nights and unfavourable days during which nets only can take effect, and that trespassers with the rod are liable to rather lighter fines.

The duration of the period during which fishing is prohibited for fear of injury to the spawn, has caused endless discussion and legislation; while the construction of wears or weirs has been a fertile source of dispute since the days of Magna Charta at the very least. The regulations upon these subjects are altogether miscellaneous, not to say conflicting, and vary both with the species

and the locality. Salmon indeed, like the house of Courtenay, is so lordly in its nature, and so migratory in its habits, as to require nothing less than a chapter of history all to itself. But the herring, said to have been introduced into England by Cerdric, in the days of Romulus Augustulus, can boast of a lengthened pedigree, and the royal whale lays claim to no slight consideration. In fact, if any one desire to become familiar with the history of this extensive branch of the animal kingdom, it is necessary that he should acquaint himself not only with the haunts and habits of the fish, but also with the Treaties, Charters, Acts and Regulations, whereby the original freedom of universal piscatory has been abridged in accordance with international, municipal, or special declaration.

The theme is by no means dry or wanting in those glimpses of national character which give colour to historical research. In classic times piscatorial rights, both public and private, were commonly recognised, as is shown by the allusions of satirists, and the numerous technical terms in use. At Pompeii, for example, if we may argue from the frescoes still extant upon the walls, angling must have been a very favourite employment. Amongst our own ancestors, the Anglo-Saxons fed largely on fish, but the Britons are said to have refrained from them out of reverence for streams and rivers, and the alleged aversion of certain large classes of the poor to this article of food may possibly be a survival of this notion. In the Venetian edition of the Older Salic Law, a fine is exacted of "MD. Denarios, XV. Solidos" for the theft of a fish. Feudalism developed the parcs or private ponds of great seigneurs to a most elaborate extent, and the Fifth Book of the Ordonnances of Louis XIV. enters into very minute particulars. The Code Rurale also, published by Royal Privilege in 1775, contains many interesting details of a system swept away a few years afterwards, like so many other remnants of Feudalism, by the force of the Revolution, in which so conspicuous a part was played by the Dames de la Halle. For the comparative freedom with which our own arrangements have been conducted we are probably indebted to the existence of the celebrated Fishmonger's Company, or "Mistery of Fysshemongers," to use their ancient title. The charters of this wealthy and famous Society carry us back as far as Richard II. The amalgamation of the two Guilds of Stockfishmongers and Saltfishmongers took place in the times of the Roses: their Common Seal stills bears the cross-keys of their patron the Fisherman; and the Fire of London is an event of yesterday in their annals. Other nations may have established a commerce as extensive and remunerative, but seldom has such a commerce been enjoyed for so long a duration. Of the foreign rivals of the Company—domestic they had none—by far the most formidable came from the sea-loving country of Holland, which at one period almost succeeded in taking the whaling trade out of British hands. A manuscript in the Harleian collection, bearing date 1632, contains "A discoverie of the Hollanders' Trade of Fishinge, and the circumventing us therein; the means how to make a profitt of the fishinge, by which they have made and yet doe reape soe greate a benefitt, with the profitt, honor and securitie that will redounde to his Ma^ties and all sorts of subjects within his Ma^ts three kingdomes by it. Written by Sr. Wm. Monson, Knt., sometyme Vice Admiral of England, and now in agitation togeather with his Ma^ts Letters Pattents for the Execution of the same." Ninety years later a Report upon the loss of the Greenland fishery was drawn up by order of Sir John Eyles, Governor of the South Sea Company. Of the high value placed upon the trade as regarded both from the political and the commercial point of view, the following passage will enable us to judge: "Is it to be expected," says

the author of the Parliamentary History, discussing the proceedings of the Scottish Parliament relatively to the Union, "that Holland will suffer us to improve our Fishery, which is their nursery for seamen, a livelihood to many families, and an immense treasure to the public?"

Such are some of the incidents which illustrate and enliven this characteristic portion of our national life; nor is the interest of the study by any means confined to archæological or historical details. On the contrary many questions relating to our fisheries are of vital and permanent importance to large masses of the population; and the welfare of the classes employed in these pursuits, the means for extending the consumption of fish amongst the poor, the discovery of new fishing-grounds, the acclimatization of fresh species, the improvement of piscatorial implements and methods, and the establishment of Government vessels for the better instruction of fishermen, are but a few of the innumerable topics relative to these matters to be found in the columns of Parliamentary Reports. And when the reader has become familiar with the varied story and multiform relations of this deeply interesting branch of the animal kingdom alike in its scientific and commercial aspects, he cannot do better than pay a visit to the lecture room of the Exhibition and there learn how the whole of this widely reaching literature and organization is but the preliminary step towards the much needed development of this valuable food for the teeming and ever multiplying millions of our poorer population.

W. M. Adams,
*Formerly Fellow of New College, Oxford.*

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## Division LVII.

### Ancient fishing implements or their reproductions—models—pictures—books—emblems—charters and seals of ancient fishermen guilds.

994. **MACMATH, W.**, F.S.A. Scot., 16 Saint Andrew Square, Edinburgh.

Volume which belonged to Isaak Walton, a gift from him to "J. K.," conjectured to have been John Ken, his brother-in-law.

Burgess Ticket of the Burgh of Peebles in favour of John Wilson, Esq., (Christopher North), dated 24th July, 1819.

Engraved Portrait of Robert Menteth of Salmonet, who, it has been said, took his title from the net in which his father, a salmon fisher in the Burgh Meadow of Stirling, caught his fish.

995. **OLSEN, O. T.**, Fish-Dock Road, Grimsby.

Ancient and Modern Books on Fish and Fisheries.

996. **PRICHARD, ERASMUS B. PRICE**, Noyadd House, Llangorse, Talgarth, R.S.O., Breconshire.

Old Hair Salmon Line, formerly used on River Wye.

'OWDON, J. P., 59 Queen's Road, Saint John's Wood, London.
Model of Isaak Walton's House, Fleet Street, London. About Year 1624.

)KINS, WILLIAM, 1 Porchester Terrace, Hyde Park, W.
Fishing Rod, Winch and Bag, fitted in a glazed Mahogany Case, a Relic of the late J. M. W. Turner, R.A.

HITSTABLE COMPANY OF FREE FISHERIES AND )REDGERS, in the County of Kent, known as "*Whitstable )yster Company*," Thomas G. Browning, Clerk, Whitstable.
Act of Incorporation 1793, and the Seal of the Company.

.Y, JOHN B., 17 Paternoster Square, London, E.C.
"A quaint Treatise on Flies and Flymaking," by an Old Fisherman. Edited by W. H. Aldam. Containing the Actual Pattern, models of twenty-five Artificial Flies and samples of the materials for making each Fly, in sunken cardboard mounts. There are also two chromo-lithographic views of celebrated fishing spots, with 91 pages of descriptive text. Handsomely bound, with appropriate design on front. With the exception of making the flies, the work was entirely produced by the Exhibitor, by whom it was also published.
"The Freshwater Fishes of England," lithographed and coloured from the picture by H. L. Rolfe, and printed by Day & Son, Lithographers to the Queen.

HELDON, JOHN, 58 Great Queen Street, W.C.
Works on Fish and Fishing.

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DIVISION LX.

**Reports, statistics and literature of fish, fishing, and fisheries.**

.FRED, HENRY JERVIS, 20 Moorgate Street, London.
"Otter's" Modern Angler, with Map of the Thames, and numerous lithographs and woodcuts of Fish and Tackle.

"Otter's" Guide to Spinning and Trolling. With illustrations.

ANDERSON, ABBOTT, & ANDERSON'S
SHING STOCKINGS AND BROGUES
Y LIGHT.] ALL IN ONE. [VERY STRONG.
7, Queen Victoria Street, London, E.C.

1003. **ARNOLD, JOHN WILLIAM,** 9 Park Street, Deal.
Essay or Treatise on Drift Net Fisheries, Tides, Fish Haunts in certain weather, Fishery Harbours, &c.

1004. **BARNETT, JAMES,** Kirkwall, Orkney.
Map of the Orkney and Shetland Islands and East Coast of Scotland, showing the necessity for increased telegraphic communication with fishing stations in Orkney and Shetland.

1005. **BATES, W.,** Publisher, "Land and Water," 176 Fleet Street, E.C.
Copies of "Land and Water."
Vols. of "Land and Water."
Frame of Prints, Casts of Fish, &c., Fishing and other subjects.

1006. **CAPEL, CHARLES CECIL,** Cray Fishery, Noots Cray, Kent, England.
Books and Pamphlets on Pisciculture for sale or presentation.

1007. **EXETER, MARQUIS OF,** Burghley House, Stamford.
Books of Fishing.
Cornelius Gesnivus de Piscibus et Serpenter, Lib. 4. A.D. 1558.
Salvitanus de Piscibus. 1554 A.D.
L'Histoire Naturelle de la Lithologie et la Conchybiologie. 1742 A.D.
Monro Structure of Fishes. 1785 A.D.
Marc Éliézer, block drawings by hand, an original copy rebound. 1797 A.D.
Auldrovandus de Piscibus et Cœtis. A.D. 1638.
Rodoletius de Piscibus. 1554 A.D.
Listan Historia Cocklearia. A.D. 1678.

1008. **FISHERY BOARD FOR SCOTLAND,** Edinburgh.
12 Years' Annual Reports to Parliament of the Fishery Board for Scotland, 1870 to 1881, inclusive, bound in one volume.

1009. **FORSTER, D. & W. H.,** Ashbourn, Derbyshire.
Book, "The Scientific Angler." 2nd edition, just published.

**WATERPROOF COATS, ETC.,**
SPECIALLY PREPARED
FOR
INDIA AND THE COLONIES.
MAKERS,
37, QUEEN VICTORIA STREET, E.C.
ANDERSON, ABBOTT, & ANDERSON.

istock Street, Covent Garden, London,

: A catalogue of books on Angling, the
:ulture, with Bibliographical Notes and an
ms touching on Angling and Fishing
authors. By Thomas Westwood and

.ton House, Winchester Road, Kilburn.
gler, or Contemplative Man's Recreation,"
and Charles Cotton, with original Memoirs
ir Harris Nicolas. Pickering's two-volume
. with 60 fine engravings and 60 India
signs by Stothard and Inskipp; further
about 5000 drawings, etchings, engravings,
utograph letters, &c., &c. Bound into 41
ial quarto; nearly the whole of the plates,
d all the letterpress. The collection com-
l, and ended 1883, by John Smith.

. Publisher, *Norwich Argus*, Norwich.
, "Fishing Literature."

Rodolph Road, Maida Hill, W.
Trawler.
Drift Boat.
Fishing.

DERIC, 55 Poland Street, Eondon, W.
Drawings," price 1s., a pamphlet classifying the
which 8,000 lives are annually lost at sea, and
rth of property, with suggestions for preventing
With other important information.

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DIVISION LXI.

## Acclimatisation of Fish and of attempts in the direction.

W. OLDHAM, Hon. Secretary to the Norfolk
Fish Acclimatization Society Lowestoft.
the Norfolk and Suffolk Fish Acclimatization Society

SON, ABBOTT, & ANDERSON'S
FISHING BROGUES, BAGS, COATS.
RE UNEQUALLED.

**JARROLD & SONS, MESSRS.**—*continued.*
Chart of the Rivers and Broads of Norfolk and Suffolk
Guide to Yarmouth.
Guide to Cromer.

1017. **LOVELL, MATILDA SOPHIA,** Catke Abbey, Derby.
"The Edible Molluscs" of Great Britain and Ireland, with Recipes for cooking them.

1018. **LOYNES, JOHN,** Elm Hill, Norwich.
A Chart, Guide Books and Photographs of the Norfolk Broads and Rivers, showing the Angling Waters.

1019. **MACKENZIE, W.,** 69 Ludgate Hill, London, E.C.
Books:—"British Fresh-Water Fishes," by Houghton, with coloured and plain illustrations by Lydon.

1020. **OLSEN, T.,** Fish-Dock Road, Grimsby.
Piscatorial Atlas.
Fisherman's Almanac, Seamanship, Signal System, Practical Navigator, Piscatorial Atlas.

1022. **PENNELL, H. CHOLMONDELEY,** 5, Cadogan Terrace, S.W.
"The Angler-Naturalist," "The Book of the Pike," "The Modern Practical Angler," "Fly-Fishing, Float-Fishing, and Trolling," "Fishing Gossip," "Pamphlets on Fish, Fishing, and Fisheries."

1023. **SAMPSON LOW, MARSTON & CO.,** Publishers, 188 Fleet Street, London.
Bound Volumes of Fishing Gazette for 1879, 1800, 1881, 1882
Specimens of the Weekly Number of the Fishing Gazette.
Notes on Fish and Fishing, by J. J. Manley, M.A. (Book.)
"Angling Literature." By O. Lambert. (Book.)
Float-fishing, and Spinning in the Thames Style. By T. M. Martin. (Book.)
"Trout Fishing in Rapid Streams." By R. Cutcliffe. (Book.)

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**SEE** CLASS VI. DIVISION 60. No.1023 for
MESSRS. SAMPSON LOW, MARSTON, & Co.'s EXHIBIT OF
**THE FISHING GAZETTE.** Volumes for 1879 to 1882.
**THE FISHING GAZETTE.** Specimens of the Weekly Issue. 16 folio pages, price 3
**A FINE OLEOGRAPH OF TROUT.** Entitled "An Evening's Fishing," after Targett (Copyright of the Editor of the *Fishing Gazette*). These permanent copies in Sixteen colours can be had of the Publishers. Price 5s. each, unframed.
*Also, SEVERAL BOOKS ON ANGLING.*
*London:* SAMPSON LOW, MARSTON, SEARLE, & RIVINGTON, 188, FLEET STREET, E.C.

**SATCHELL, W.**, 19 Tavistock Street, Covent Garden, London, W.C.

Twelve Printed Books.

Bibliotheca Piscatoria: A catalogue of books on Angling, the Fisheries and Fish-culture, with Bibliographical Notes and an Appendix of Customs touching on Angling and Fishing from old English authors. By Thomas Westwood and Thomas Satchell.

**SMITH, JOHN**, Beighton House, Winchester Road, Kilburn.

"The Complete Angler, or Contemplative Man's Recreation," by Izaak Walton and Charles Cotton, with original Memoirs and Notes by Sir Harris Nicolas. Pickering's two-volume edition of 1836, with 60 fine engravings and 60 India proofs, after designs by Stothard and Inskipp; further illustrated with about 5000 drawings, etchings, engravings, photographs, autograph letters, &c., &c. Bound into 41 volumes, imperial quarto; nearly the whole of the plates, &c., inlaid, and all the letterpress. The collection commenced in 1841, and ended 1883, by John Smith.

**SOMAN, PHILIP**, Publisher, *Norwich Argus*, Norwich.

A Book entitled, "Fishing Literature."

**TULLOCH, C.**, 12 Rodolph Road, Maida Hill, W.

Accounts of a Trawler.

Accounts of a Drift Boat.

Work on Sea Fishing.

**WILKINS, FREDERIC**, 55 Poland Street, Eondon, W.

"Wrecks and Drawings," price 1s., a pamphlet classifying the courses from which 8,000 lives are annually lost at sea, and £8,000,000 worth of property, with suggestions for preventing these evils. With other important information.

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## Division LXI.

### Reports on Acclimatisation of Fish and of attempts in the direction.

**CHAMBERS, W. OLDHAM**, Hon. Secretary to the Norfolk and Suffolk Fish Acclimatization Society Lowestoft.

Report of the Norfolk and Suffolk Fish Acclimatization Society

**ANDERSON, ABBOTT, & ANDERSON'S**

BOOTS, TROUSERS, STOCKINGS, **FISHING** BROGUES, BAGS, COATS,

ARE UNEQUALLED.

**CHAMBERS, W. OLDHAM**—*continued.*
—Patron H.R.H. the Prince of Wales; President, E. Birkbeck, Esq., M.P.—showing the attempts that have been made to acclimatize food fishes in the waters of East Anglia.

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## OBJECTS EXHIBITED IN THE GROUNDS.

1030. **SILK, W. T.**, for the Marquis of Exeter, Burghley Park, Stamford.
Skeleton of Whale.

1031. PRIMROSE AQUARIUM.

1032. LUMINOUS PAINT BUILDING.

1033. POST AND TELEGRAPH OFFICE.

1034. **CLARK, BUNNETT & CO., Limited,** Engineers, Rathbone Place, London.
Model of Smith's Hydraulic Dredging Plant.

1035. **PRIESTMAN BROTHERS,** 52 Queen Victoria Street, London, E.C., and Holderness Foundry, Hull.
Working Model of patent Dredger for cleaning rivers, small harbours and fishing stations.
Priestman's Patent Steam Dredger, specially adapted for dredging small fishing stations, harbours, rivers, &c.

1036. WILLESDEN PAPER COMPANY'S FISHERMAN'S COTTAGE.

1037. TENTS FOR FISHERMEN.

1038. **HUMPHREYS, J. C.,** Albert Gate, High Road, Knightsbridge.
Fishermen's Cottage, living Room and two Bedrooms, furnished ready for use, including all necessaries, the whole to be erected complete in any part of the United Kingdom for the sum of £150. It is to show an economical way, and how cheaply fishermen can be comfortably housed, no matter how wild or stormy the coast. The cottage will also be useful for coast guard stations, life-saving stations, &c. It can be erected complete in any part of the United Kingdom in one month, or packed and sent abroad for re-erection.

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**ON PEUT SE PROCURER CETTE ANNONCE EN** français en s'adressant à M. HUMPHREYS, soit à son Bureau à l'Exposition, derrière le Pavillon royal de H.R.H. le Prince de Galles, soit à l'Usine, près de Albert-Gate, vis-à-vis *la Caserne* de Knightsbridge.

**ANGLO-NORWEGIAN GUANO, PHOSPHATE & ISINGLASS CO., LIMITED,** Dashwood House, New Broad Street, E.C.

Samples of Isinglass.
Samples of Cod Liver Oil.

ENGINE HOUSE.

EXTENDED TRAWL NET.

LONDON STEREOSCOPIC COMPANY.

DIVING APPARATUS.

SHIPWRECKED MARINERS' CLUB.

**MANUFACTURERS' AND MILLOWNERS' ASSOCIATION.** Incorporated by special Act of Parliament (44 and 45 Vict. cap. 203) for the purpose of assisting manufacturers, millowners, and others to comply with the provisions of the Rivers Pollution Prevention Act.

Collective Exhibit of Models for purifying the discharge from lead and copper mines, paper mills, tanneries, china clay and other works, and specimens of the discharge as it flows from those works, and as, after treatment, it enters the stream, with specimens also of the clays and other substances extracted in the course of the treatment.

**BURGOINE, C. & A.,** Kingston on Thames, Surrey.

Model of Boat with handier and safer rig than the ordinary Lug Sail, not requiring to be dipped at every tack in beating to windward.

14 ft. Model Boat with well for Fishing and sufficient draught to beat to windward. Rigged with improved Balanced Lug and Mizen, with simple Reefing Gear.

Model of Improved Tackle for management of Tug and other Sails on Board Small Fishing Craft.

## SEVERN FISHERIES BOARD.

WILLIS BUND, *Hon. Sec.*

NETS (MOVABLE).

Cleeching Net.

This Net is used chiefly in floods to take fish that have found their way into any ditch or backwater. It is one of the most poaching Nets used.

The Best and Cheapest. First Established 1825.
NEAVE'S FOOD FOR INFANTS AND INVALIDS.
IN ONE-POUND ONE SHILLING CANISTERS.
SOLD EVERYWHERE. WHOLESALE OF THE MANUFACTURERS,
J. R. NEAVE & Co., Fordingbridge, England.

## SEVERN FISHERIES BOARD—*continued.*

Eel Net.

These Nets are fixed across the river in the summe autumn to catch eels migrating seawards. They fis middle of the river, the bottom line on the bed of the st the top a few feet below the surface, so as to let the ru pass over. They are only used when the water is high discoloured.

Beating Net.

Net used by fishermen in the freshwater. It is fas round a bush or tree, and the water inside the Net b with poles, the fish trying to escape get caught in the It is a trammel or armoured Net.

Lave Net.

Net used by fishermen in the estuary to take salmon o sands in the shallow water.

Shrimp Net.

Net used on the sands for taking shrimps and small fis

### Nets (Fixed).

Stop Net.

Net used in the tidal portion of the river. Fish ascen or descending the river strike against it. The stri pulled, and the fish caught in a bag.

Sprat Nets.

Nets fixed to stakes in the tidal part of the river i autumn and winter months to take sprats coming down o ebb tide.

### Fixed Engine.

Putchers.

Engines used in the Bristol Channel for catching Sa They are fixed in certain places in ranks, and the tide the fish into them.

Putts No. 1.

These Putts are used at the Count Rocks, Oldbury, Gl tershire, for taking salmon, shrimps, and various kin fish. The smaller fish get carried by the tide into the m part of the Putts. The large fish are prevented passin Putts, and generally found in pools near them.

Putts No. 2.

ANDERSON, ABBOTT, AND ANDERSON'S
PATENT TANNED CANVAS RUBBER-LINED FIRE H
AS SUPPLIED TO THE LONDON METROPOLITAN FIRE BRIGADE.

From the "TIMES," Dec. 5th, 1879.—"Yesterday the leathern hose of the Metropolitan Brigade w In favour of a New Tanned-Canvas Hose Lined with India-Rubber, about 30,000 ft. of which has been [illegible] the Brigade by the Inventors, Messrs. ANDERSON, ABBOTT, and ANDERSON. The new hose was tested w pressure on the square inch, and, with the exception of one short length, all was accepted. The new ho advantage of being waterproof, and can convey water through a warehouse or food without damage to the goods. It is claimed for it that it is cheaper, lighter, and stronger than leathern hose, will not rot labour to convey it to the hydrants, does not need dressing to keep it in order as leather does, and is not so burnt. Captain Shaw was yesterday present at the testing of the hose, and expressed himself perfectly sa the new material."

37, QUEEN VICTORIA STREET, E.C., LONDON, ENGLAND.

**SEVERN FISHERIES BOARD**—*continued.*

These Pults are used on the mud near the New Passage, Gloucestershire, for taking shrimps, small soles and sea fish. Occasionally salmon are taken in them, but only under exceptional circumstances.

Model of a Fishing Weir at Preston Boats near Shrewsbury.

This is a Weir used solely for the purpose of fishing. Eels and freshwater fish are what are usually caught at it.

Ground plan of same.

Model of Fishing Weir at Fitz, Shropshire.

Ground plan of same.

Weels used on the apron of Weirs for taking lamperns. Lamperns ascend the river in large numbers in the autumn and winter during a fresh, and then baskets are placed on the Weirs with their mouth down stream, and the lamperns find their way into them.

Eel Putchons.

These are the ordinary eel baskets that are baited and placed in the river during the spring and summer months for eels.

Hard weels.

Large baskets in which eels and lamperns are kept alive until sold.

Coracles.

Boats used on the Upper Severn and Welch Rivers by the fishermen.

Model of Trunk or Well Boat.

The usual mode of keeping fish alive is by placing them in one of the wells.

FISH PASSES.

Plan showing the Fish Passes erected by the Severn Commission in the Weirs across the Severn, under the Acts.

Maisemore (Gloucester).
Llanthony (Gloucester).
Tewkesbury.
Diglis (Worcester).
Bevere (near Worcester).
Holt (Worcestershire).
Camp (near Stourport).

Plan and section of Fish Pass at Glenhafron on the Severn; example of a Pool Pass.

**FOR STEAM JOINTS.**

**MERRONCEL'S Patent Plastic Compound Sheet (called Leather Silk) is employed by the French Government, the Principal Railways, and Transatlantic Steamboat Companies, &c. Unequalled for immediate application, without waste to any steam joints, and equal to the severest tests.**

**ANDERSON, ABBOTT, AND ANDERSON,**

*INDIA-RUBBER MANUFACTURERS.*

**17, QUEEN VICTORIA STREET, E.C., LONDON, ENGLAND.**

**SEVERN FISHERIES BOARD**—*continued.*

Plan and section of Fish Pass at Milford near Newtown, Montgomeryshire.

Plan and section of Fish Pass at Penarth Weir on the Severn.

Plan of Fish Pass at Powick Weir, Worcestershire.

Plan of Grating at Abertanat, Montgomeryshire, to prevent fish descending Canal.

Model of same.

Plan of Grating at Brinfield, Shropshire.

Old Plan of the Fixed Engine in the Severn Estuary before 1865.

Photograph of an ancient mode of fishing declared illegal in 1861, carried on at Dolanog, Montgomeryshire, on the Verniew.

1049. **THOMAS, E. C. G.**, National Club, Whitehall.

Model of Harbour for fishery purposes, consisting of a floating breakwater or outer harbour, as an anchorage at all times of tide and weather; an inner harbour with wharves, the sea walls so placed as to form a well-defined entrance, and constructed in such a form as to admit additional wave water, and thus make the outgoing tide completely overpower the incoming one in its action on the bar at the mouth of any river or creek. This action, aided by the automatic submarine dredge, permanently sweeps away the bar and prevents it from reforming.

Model of Greenway Breakwater sheltering a lighthouse, and giving access to them at all times. Thus preventing the chance of the starvation of the men and extinction of the lights as almost occurred recently at three of the most important lighthouses—Calf, Wolf, and Eddystone.

Model of Greenway Breakwater as supplementing existing harbour works, protecting the existing stone piers, and thus obviating the necessity for frequent repairs as at Wick (where the sea overturned a massive coping of 800 tons in one block), Plymouth, &c., and creating an additional outer-anchorage.

Electric Motor Wave Apparatus and Tank, for showing the action of waves in motion on the Greenway Breakwater, with Model of Fishery Harbour and Lighthouse protected by the breakwater.

**ANDERSON, ABBOTT, & ANDERSON'S**
Waterproof GUN COVERS,
GAME BAGS,
CARTRIDGE BAGS, are the best.
37, Queen Victoria Street, London, E.C.

**BURGOINE, C. & A.**, Kingston-on-Thames, Surrey.
Fishing Boat for rivers or lakes.
24-ft. Thames Skiff, with fish well (wet or dry at pleasure), fitted with screw plug and pump.

**BARTLETT, A. D., & SON.**
Glass Case containing Teeth and Jaws of Great Blue Shark, Arctic Shark, Tiger Shark, Crab-eating Skate, Rhina Skate. Common Skate.
Skull and Teeth of Elephant Seal or Sea Elephant, Sea Lion, Greenland Seal, Common Seal.
Manatee.
Dugong.
Walrus.
Crocodile.
Spiny Skate Skin.
Squaco Heron.
Buff-backed Heron.
Penguin.
Kingfishers.

*JOHN GLEN,*

*ADVERTISEMENT AGENT,*

*13a, Salisbury Square, Fleet Street,*

*LONDON, E.C.*

*Agent to the Contractors (WILLIAM CLOWES & SONS, Limited) for the Official Publications of the Great International Fisheries Exhibition, 1883.*

# ISLE OF MAN.

The Isle of Man is an island in the British Seas, 35 miles long and about 12 miles at its greatest breadth, containing an area of about 350 square miles, and a population of 53,492 souls.

The island enjoys the advantages of Home Rule. It has its own legislature, its own judicature, and an independent revenue.

There are five ports in the island from which fishery operations are mainly conducted, viz., Douglas, Ramsey, Peel, Port St. Mary, and Port Erin.

Peel is the most important of these ports. The town of Peel possesses 194 first-class boats, measuring 5,044 tons; 170 of these boats are supplied with full trains of mackerel and herring nets, and represent a total capital of £750 a boat, or £127,500. The 24 other boats are supplied with only a herring train, and represent a capital of £550 each, or £13,200. Peel has about 35 second-class boats, representing £200 each, or £7,000. The total capital embarked in the fishery at Peel is therefore £147,700. 1,727 men and boys are employed in the fishery.

Port St. Mary, with the adjacent ports of Castletown and Port Erin, is the next most important. It contains 101 boats, representing a tonnage of 2,095 tons, with a capital of £80,800, and employing 787 men and boys. In addition, 10 boats manned by two men each, are employed in the southern ports of the island lobster fishing, and earn £500.

These boats are principally engaged in the spring and early summer in the Kinsale mackerel fishery; in the summer and autumn, in the home and Irish herring fishery; and in the winter, to a certain extent, in the long-line fishery; but they also go to Scotland and various parts of England. The earnings of the Peel boats are said to amount to—

| | |
|---|---|
| Kinsale mackerel fishery .. .. .. | £42,000 |
| Herring fishery .. .. .. .. | 40,000 |
| Long-line fishery .. .. .. .. | 1,500 |
| | £83,500 |

Placing the earnings of the Port St. Mary boats at the same proportion, they would amount to £40,500.

The port of Douglas contains 11 first-class boats, 15 second-class boats, and 9 third-class boats, having a total tonnage of 333 tons, employing 119 men and boys, and valued at £2,800. The larger of these boats are trawlers, and work between Liverpool and the island.

Ramsey has 90 boats engaged in the fishery, with a tonnage of 609 tons, representing a value of £10,306 and employing 219 men and boys. The principal fishery here is the long-line fishery for cod, which extends from the beginning of October to the end of May. In October, November, April, and May, it is conducted in small open lug-rigged boats manned by 5 men; during December, January, February, and March, the fishery is conducted in deep sea-fishing boats yawl-rigged, with 50 feet keel and of 50 tons burthen. The cod fishery thus occupies the time of the Ramsey fishermen for eight months out of every twelve. During the summer months four of the cod boats are engaged in fishing for conger on the west of the island, four of them go to Kinsale, while 64 boats, each manned by only one man, are engaged in fishing for mackerel.

ıe statistics of the Ramsey fishery may be summarized as follows :—

| No. of boats. | Tons. | Men and boys. | Value. |
|---|---|---|---|
| 90 | 609 | 219 | £10,306 |

ıe yield of the Ramsey fishery is as follows :—

| | |
|---|---|
| 1. Open cod boats .. .. .. .. .. | £1,560 |
| 2. Deep sea boats .. .. .. .. .. | 5,760 |
| 3. Mackerel fishery .. .. .. .. .. | 1,344 |
| 4. Eels, &c., fishery .. .. .. .. .. | 720 |
| 5. Kinsale fishery .. .. .. .. .. | 1,200 |
| 6. Miscellaneous, lobsters, &c. .. .. .. | 300 |
| | £10,884 |

he capital, therefore, embarked in the fisheries of the Isle of Man is as ows :

| | |
|---|---|
| 1. Peel .. .. .. .. .. .. .. | £147,700 |
| 2. Port St. Mary, Castletown, &c .. .. .. | 80,500 |
| 3. Ramsey .. .. .. .. .. .. | 10,306 |
| 4. Douglas .. .. .. .. .. ... | 2,800 |
| | £241,306 |

he people employed in fishing in the Isle of Man are as follows :—

| | |
|---|---|
| 1. Peel .. .. .. .. .. .. .. | 1,727 |
| 2. Port St. Mary, Castletown, &c. .. .. .. | 787 |
| 3. Ramsey .. .. .. .. .. .. | 219 |
| 4. Douglas .. ... .. .. .. .. | 119 |
| 5. Lobster fishing .. .. .. .. .. | 20 |
| | 2,872 |

he yield of the Insular fisheries may be computed as follows :—

| | |
|---|---|
| 1. Peel .. .. .. .. .. .. .. | £83,500 |
| 2. Port St. Mary, Castletown, &c. .. .. .. | 40,500 |
| 3. Ramsey .. .. .. .. .. .. | 10,884 |
| 4. Douglas .. .. .. .. .. .. | 5,000 |
| 5. Lobster fishing .. .. .. .. .. | 500 |
| | £140,384 |

n round numbers, therefore, some £250,000 is embarked in the fishery, while returns are about £140,000 annually. Assuming that 10 per cent. is required ually to replace the capital, and repay the interest on it, £115,000 is avail- for division among the 2,870 men and boys employed, or £1 a week for each and boy for 40 weeks during each year.

hese figures do not, however, represent the whole value of the fisheries to the nd. It will be readily understood that the fisheries indirectly support a con- nable number of persons who are engaged as boat builders, net makers, or in r ways for supplying the fisheries; the boats which are built in the Isle of for the herring fishery are probably the finest and best found in the world; people, at the very lowest estimate, are employed in these industries.

hile out of a total population of rather more than 53,000, 2,870 men and

boys, representing 11,000 people, are engaged in fishing, 700 other people, men, women, girls, and boys, representing say a population of 2,000, are employed in industries dependent on fishing; 13,000 people out of a population of 53,000, are thus either directly or indirectly dependent on fishing for their livelihood.

The Insular Government have of late years spent large sums of money in improving the harbours of the island. It is at the present moment improving the harbour at Peel, with the special object of improving the fishing industry, at a cost of £24,300; and it is constructing a new breakwater at Port St. Mary, at a cost of £15,580. Plans of these harbours are at the exhibition: The Insular Government is also spending considerable sums of money in harbour works at Ramsey, Port Erin, and Douglas.

There is no other portion of Europe, and with the exception of Newfoundland, there is probably no other country in the world where so large a proportion of the population is dependent on fishing for their livelihood. Great Britain is usually supposed to have the most important fisheries in the world. In Great Britain probably 100,000 men (say 400,000 people with their families) earn their livelihood by fishing; and one person out of about every 75 is thus dependent on the fisheries. In the Isle of Man one person out of every five depends on fishing for his daily bread, and one person out of every four is directly or indirectly dependent on fishing for a livelihood.

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## LIST OF EXHIBITS FROM THE ISLE OF MAN.

### CLASS I.—SECTION I.

### FISHING.

[SEA FISHING.]

DIVISION I.

**Gear of every description, and of all nations used in trawl, herring, long line, hand line, and every other mode or system of fishing, including all nets, lines, hooks, harpoons, tackle, &c., employed in the same.**

**CORRIN BROTHERS,** Net Manufacturers, Peel.
2 Barked and mounted Herring Nets.
2 Barked and mounted Mackerel Nets.
1 White unmounted Herring Net.
2 White unmounted Mackerel Nets.
2 White unmounted Mackerel Nets.
2 White unmounted Mackerel Nets.
3 Hanks of Thread.

**GOLDSMITH, HENRY,** Ramsey.
1 "Mudlag" or Buckie Creel for bait catching.
1 Sand Eel or Gibbon Grip.
1 Pair of "Corran Gibbon" or Sand Eel Sickles.

**DUGHIN, JOHN,** Net Manufacturer, Peel.
1 Cotton Mackerel Net, mounted and ready for use.
1 Cotton Mackerel Net, plain in web.
1 Cotton Herring Net, mounted and ready for use.
1 Cotton Herring Net, plain.
3 Cotton Herring Nets, plain.
1 Pilchard Net.

**NOX, WILLIAM,** Douglas.
Net Sinkers, of a composition that will not rust or corrode the net or ropes.

**OONEY, EDWARD,** Ramsey.
1 Balk or long line for cod-fishing, barked, with "mollag," or buoy, and hair "thow," or buoy rope.
1 Fluke or Shore Line.
1 Whiting Line.
1 Mackerel Line.
1 Scallop Dredge.

**MOORE, THOMAS, C. S.,** Net Manufacturer, Peel.
1 Piece of Mackerel Net, full mounted.
1 ditto, plain white, as taken off loom.
1 Piece of Herring Net, full mounted.
1 ditto, plain white, as taken off loom, 50-9 ply yarn.
1 ditto. ditto. ditto. 18-4 ply yarn.

**QUALTROUGH, EDWARD,** Net Manufacturer, Port St. Mary.
1 Cotton Mackerel Net, complete, showing method of mounting, roping, tanning, &c.
1 Cotton Mackerel Net, showing manufacture and quality.
1 Cotton Herring Net, complete, showing method of mounting, roping, tanning, &c.
1 Cotton Herring Net, showing manufacture and quality.
Ivory Netting Needle used for mending nets.

**QUANE, C. B.,** Douglas.
Two Horsehair Lines for hand fishing, similar to those formerly used by the Manx fishermen.

*ANDERSON, ABBOTT, & ANDERSON'S*
**FISHING TROUSERS**
**Are unequalled for Quality, Finish and Wear.**
37, QUEEN VICTORIA ST., LONDON, E.C.

## Division III.

### Fishing craft of all nations; models and representations of the same.

i. Steam fishing vessels and steam carriers—

**ISLE OF MAN STEAM PACKET COMPANY.**

Models of their steamers:—

"Mona's Isle," 330 × 38 × 15. Gross tonnage, 1500. Indicated horse-power, 4,500.

"Ben-my-Chree," 310 × 31 × 13·6. Gross tonnage, 1030. Indicated horse-power, 2,300.

"King Orry," 260 × 29 × 14·6. Gross tonnage, 813. Indicated horse-power, 1800.

"Snaefell," 250 × 29 × 14·6. Gross tonnage, 785. Indicated horse-power, 1800.

"Fenella," 200 × 26 × 15·6. Gross tonnage 518. Indicated horse-power, 1000.

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## Division IV.

ii. Fishing Vessels and Boats other than Steam Vessels—

**BRAYDON, THOMAS,** Ramsey.

Model of 24 feet open Cod Boat, scale 1 inch to foot, with sails and equipment complete, mounted on bog-oak stand.

**GRAVES, HENRY,** Boat Builder, &c., Peel.

Model of an elliptical stern "Dandy" rig Fishing-boat, 50 feet keel and 16 feet beam; scale ½ inch to the foot. This rig is rapidly superseding the class of boat for many years used in the Isle of Man, known as "Nickeys," or lug sail boats, none of which are being built at present. The Exhibitor supplies a large number similar to the model, but varying in size from 44 to 50 feet keel, to the South and West Coasts of Ireland, and in their construction and the home trade employs at times from 80 to 100 men, including carpenters, joiners, sail makers, rope makers, block makers, shipsmiths, &c.

*The Leve Antipluvium Waterproof*

BICYCLING AND TRICYCLING

ELEGANT, VERY LIGHT. SUITS. THOROUGHLY WATERPROOF.

ANDERSON, ABBOTT, AND ANDERSON, SOLE MAKERS.

**HARRISON, RICHARD,** Port St. Mary.
Model of Manx Fishing-boat, with lifting decks, to show inside fittings, built on scale, framed and planked.

**LUCAS, KELLOR,** Ramsey.
Model of Bahama Lightship, Ramsey Bay.

**QUALTROUGH & CO.,** Ship Builders, Douglas.
Half-model of Fishing Boat of 50 feet keel, 15 feet 6 inch beam, and 8 feet 6 inch depth, Dandy rig. Price with sails, anchors and chains complete, £500.

**QUALTROUGH, JOSEPH,** Ship Builder, Port St. Mary.
Model of Fishing-boat, 48 feet keel, 14 feet 6 inch beam, depth of hold 8 feet, framework oak, outside plank pitch pine, iron capstain, lugger rigged, cost £370 complete; scale ½ inch to the foot.

**WATSON, T.,** Ship Builder, Peel.
Model of Lug Rigged Fishing Boat.
Model of Dandy Rigged Fishing Boat.

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## Division V.

### Ropes and canvas suitable to fishing vessels.

**GRAVES, HENRY,** Rope Manufacturer, &c., Peel.
Samples of Ropes used for mackerel fishing, the largest being the hauling rope, the medium the sole, or that used at foot, and the smallest at top of net; also sample of coil of Manila rope used in rigging Dandy-rigged fishing boat.

**MOORE & SON, W. F.,** Sail Cloth Manufacturers, Tromode, Douglas.
7 Bolts, first quality, from No. 1 to 7, all long flax sailcloth and specimens of the flax from which the sailcloth is made, showing the various processes through which it passes from its growth to the manufactured state.

**QUIGGIN & Co.,** Rope Manufacturers, Douglas.
Samples of Rope, 60 fms. 5 inch tarred Manila trawl rope, 4 strand.

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COPY OF TESTIMONIAL GIVEN RESPECTING
ANDERSON, ABBOTT, & ANDERSON'S
REGULATION ARMY WATERPROOF CLOAK.

HEAD QUARTERS, R.V.C., BERWICK-UPON-TWEED, *May* 25, 1877.

GENTLEMEN,—I have sent the Regulation Cloak that I purchased from you some five or six years ago. Will you have the goodness to put a new collar on it, and return to me.

In justice to yourselves I ought to mention that the cloak in question has seen a good deal of rough work, and with the exception of the collar is not very much the worse.—Yours obediently,

(Signed) ROBERT WEDDELL, CAPTAIN, 1st B., R.V.C.

MESSRS. ANDERSON, ABBOTT, and ANDERSON, *Queen Victoria Street, London, E.C.*

**QUIGGIN & Co.**—*continued.*

1 Coil Manila Top Ropes, same as supplied for Kinsale Fishery.
1 Coil Manila Sole Ropes, ditto.
1 Coil Manila Stoppers, ditto.
4 Coil Manila Spring Backs, ditto. 2¾ in., 2½ in., 2¼ in., 2 in.
50 fms. 4-in. Manila Swing, 4 strand.
1 Coil 4-in. Bolt Rope, for fishing vessels' sails.
1 Coil tarred Manila Trawl warp, 60 fms. 5½ in., 4 strand.

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DIVISION VI.

**Steam and hand capstans, compasses, barometers, telescopes, lights, lamps, fog horns, systems of signalling at night for fishing fleets and vessels, electric lights, luminous paint, and other equipment of fishing vessels, charts for fishermen.**

**HENDRICK, EDWARD,** Douglas.
Steam Capstan Engine for Fishing boats.

**KNOX, WILLIAM,** Douglas.
Steam Capstan for Fishing boats, complete, fitted in Boat.

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CLASS II.

ECONOMIC CONDITION OF FISHERMEN.

DIVISION XXI.

**Apparel and personal equipment.**

**KNEALE, WILLIAM HARDY,** Ramsey.
1 Pair "Loughtan" Woollen Trousers, undyed, hand-spun and woven.
1 Pair "Russett" Woollen Trousers, undyed, hand-spun and woven.
1 Coat and Vest of Manx make, navy blue cloth.
1 "Plucked wool" hand spun and woven Jersey.

**ANDERSON, ABBOTT, & ANDERSON'S**
**FISHING STOCKINGS**
**ARE GUARANTEED ABSOLUTELY WATERPROOF.**
**37, Queen Victoria Street, London, E.C.**

**KNEALE, WILLIAM HARDY**—*continued.*

1 "Clipped wool" hand spun and woven Jersey.

1 "Curleid Lhiabbe," or sleeping-rug, used at sea by Manx fishermen. Double twisted yarns. Double warp and weft, hand spun and woven.

Manx Ensign.

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## CLASS V.

## NATURAL HISTORY.

[AQUARIA.]

### DIVISION XLVI.

**Specimens living (marine and fresh water), fresh, stuffed or preserved, casts, drawings, and representations of—**

(*e*) Mollusca of all kinds and shells not included in Class III.

**GOLDSMITH, H.**, Ramsey.

Specimens of Mudlag, or Buckies, or Whelks.

Specimens of Scallops.

Specimens of Sea Urchins.

---

### DIVISION XLVIII.

(*g*) Worms used for bait, or noxious; leeches, &c.

**KERMODE, P. M. C.**, Ramsey.

Specimens of Lug Worm.

Specimens of White Worm.

---

### DIVISION LI.

(*k*) Fish of all kinds.

**GOLDSMITH, H.**, Ramsey.

Fork beard Fish.

The Best and Cheapest. First Established 1825.

NEAVE'S FOOD FOR INFANTS AND INVALIDS.

IN ONE-POUND ONE SHILLING CANISTERS.

SOLD EVERYWHERE. WHOLESALE OF THE MANUFACTURERS,

J. R. NEAVE & Co., Fordingbridge, England.

### Division LIII.

(*m*) Aquatic and other birds hostile to fish or fishing.

**KINVIG, T. H.**, Castletown.

Stuffed Specimens of—

Great Northern Diver.
Large Cormorant.
Tufted Cormorant or "Shag."
Guillemot.
Puffin.
Channel or Razor Bill.
Black back Gull.
Sea or Herring Gull.
Golden Eye Garrotts.
Pochards.
Wild Goose.
Mallard.
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Maganza Duck.
Widgeon.
Heron.
Shelldrake.
Gannets.
Burgomaster Gull.
Curlew.
Pacific Curlew.
Kittywake (Gull).
Coot.
Oyster Catcher.

---

## Class VI.

## HISTORY AND LITERATURE OF FISHING—FISHERY LAWS—FISH COMMERCE.

### Division LVII.

**Ancient fishing implements or their reproductions—models—pictures—books—emblems—charters and seals of ancient fishermen guilds.**

**CRAINE, JOHN**, Publisher, Ramsey.

Messrs. Poulton's Photographic Views of Manx Marine Scenery.

ANDERSON, ABBOTT, & ANDERSON'S
Are Unequalled.
WADERS WITH BROGUES ATTACHED.
Are Guaranteed.
37, QUEEN VICTORIA STREET, LONDON, E.C.

**DEAN, G. A.**, Photographer, Douglas.
Coast and Lighthouse Views of Isle of Man.

**INSULAR GOVERNMENT.**
Plans of Insular Harbours.

**LEWIS, ABEL**, Photographer, Douglas.
Marine Views of the Isle of Man.

**MOORE, A. W., ESQ.**
3 Charts, showing result of Meteorological Observations.

**TELLET, F. S.**, L.K.Q.C.P.L., Ramsey.
Great Britain's Coasting Pilot, being a new and exact survey of the Sea Coast of England and Scotland by Captain Greenvile Collins, Hydrographer in Ordinary to the King's Most Excellent Majesty, London, MDCCLXIV.—*Vide* Pepys' "Diary."

Map of Harwich, dedicated to Samuel Pepys, Esq., Secretary of Admiralty of England, President of Y^e Royall Society, and Maister of Y^e Trinity House, of Deptford, Stroud.

Map of Y^e Isle of Man with view of Peel Castle, dedicated to Y^e Rt. Hon. William Earl of Derby, Lord of Y^e Isle of Man.

A Protection of a Harpooner in the Greenland Trade, March 19th, 1778.

For Watering Gardens and Lawns, Washing Carriages, Floors, and Ships' Decks, and all necessary
INDIA-RUBBER HOSE.
Fittings, etc.
87, QUEEN VICTORIA ST., LONDON, E.C.
ANDERSON, ABBOTT, & ANDERSON.

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956. Brunton, John, M.A., M.D., 21 Euston Road, London, N.W.
957. Burroughs, Lieut.-Gen. F. W. Traill, C.B., Ronsay, Orkney, N.B.
969. Burton, H. J., & Son, 191 Wardour Street, Oxford Street
970. Butt, George F., 49 Wigmore Street, W.
958. Careless, George Dyer, 52 Arundel Street, Landport, Portsmouth
971. Cooke, T., & Son, Naturalists, 30 Museum Street, W.
959. Eedle, Thomas, 40 Goldsmith Row, Hackney Road
960. Fraser, Simon, 11 Huntly Place, Inverness, N.B.
972. Gardner, James, 29 Oxford Street, London, W.
961. Gunn, T. E., 47 St. Giles Street, Norwich
962. Helstrip, C., 13 St. Saviour's Place, York
963. Hodges, W. J., Aucuba Villa, Lavender Hill, S.W.
964. Howlett, W., High Street, Newmarket
965. Jardine, Alfred George, 38 Old Change, London
Kinvig, T. H., Castletown, Isle of Man
966. Roberts, Thomas, Castle Meadow, Norwich
967. Sachs, Thomas Ransom, 22 Hyde Park Place, London, W.
968. Snowie, Hugh, & Sons, Church Street, Inverness
954. Zoological Society, Hanover Square, London, W.

## ANTISEPTICS.

654. Antitropic Company (W. F. Grier & Co.), Glasgow
651. Bumsted & Company, D., 36 King William Street, E.C.
649. Corbet, J., M.P., Stoke Works, Worcestershire
650. Droitwich Salt Company, Limited, 8 & 9, Lower Thames Street, E.C.
652. Gow, John
648. Renshaw, James, Northwich, Cheshire
653. Sanitas Company, Limited, 3 Colt Lane, Bethnal Green, E.

## BAGS AND MATTING.

2. Knowles & Knowles, Zebu Works, Southcoates, Hull
5. "Willesden" Waterproof Paper & Canvas Co. (Limited), Willesden Junction, N.W.

## BASKETS.

22. Murray, A., Lossiemouth, Morayshire
39. Mair, G., Commerce Street, Branderburg, Morayshire

## BENEVOLENT SOCIETIES.

549*b*. Shipwrecked Fishermen's and Mariners' Royal Benevolent Society, Hibernian Chambers, London Bridge
549*c*. Thames Church Mission to Seamen, Fishermen, &c., 31 New Bridge Street, Ludgate Circus

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346. Hamblin, N., Jun., 57 Bow Lane, Poplar, E.
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98. Hodgson, J. W., 48 Redbourne Street, Hull
99. Hoad, J. C., Jun., Rye, Sussex
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345. Humble, W. & Son, Limekiln Shore, North Shields, Northumberland
97. Irvine, F., 14 Skene Street, Macduff, N.B.
102. Jeans, John, 65 Blair Street, Poplar, E.
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121. Johnson, F. C., 10 Lyle Street, Greenock
167. Johnston, W., Scalloway, Shetland, N.B.
58. Jones, Captain A. J., 2 Sandown Terrace, Chester
175. Kemp, R., Jun., Mutford Bridge, Lowestoft
146. Keymer, H. J. C., Fisheries Iron Works, Great Yarmouth
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66. King, J., & Co., Three Colt Street, Limehouse, E.
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403. Laurence, J. R., Fair Isle, Shetland
139. Lee and Wright, Tweedmouth, Berwick-on-Tweed
109. Leigh-Smith, R., 64, Gower Street, W.C.
349. Leslie, W., & Hamblin, N., New Road, Blackwall
369. Life Boat Institution, The Royal National, 14 John Street, Adelphi, W.C.
185. Livie, David B., Jun., Victoria Dock, Dundee
174. Loynes, J., Elm Hill, Norwich
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150. McMillan, A., 33 Eton Street, Hull
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133. Messume & Sons, E., Lower Road, Richmond, Surrey
108. Metcalf & Wood, Albert Dock Locks, Hull
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161. Moir, J., 11 Upper Grove Place, Edinburgh
6. Morris, C. W., Harbour View, Lowestoft
120. Mundahl, C. M., Fish Docks, Grimsby
143. Noble, J., 38 Castle Street, Fraserburgh, N.B.
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4. Parser & Company, Limited, 21 Arundel Street, W.C.
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125. Woodhouse, H., Bridge Street, Maidenhead
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386. Wright, J., 15 Jamaica Boad, Bermondsey, S.E.
122. Wright, J. P., Bank of England, E.C.
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338. Young, Lambton, C.E., 16 Harcourt Terrace, Redcliffe Square, S.W.

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13. Alexander & Co., 19 Westminster Bridge Road, S.W.
348. Baharie & Adamson, 7 Lawrence Street, Sunderland
357. Beeching Bros., Ship and Boat Builders, Great Yarmouth
419. Berwick Salmon Fisheries Company (Limited), Berwick-on-Tweed

## BUOYS.

272. Cator, R. P., Rear-Admiral, Langley Farm, Beckenham, Kent
336. Gray, J. W., & Son
397. Penhey, W. H., 4 Sherland Villas, Twickenham
373. Steedman & McAlister, Cathcart Street, Glasgow

## CANVAS (SAILCLOTH) AND TARPAULIN.

209. Edgington, B., 2 Duke Street, London Bridge, S.E.
328. Edgington, B., London Bridge
16. Edinburgh Roperie and Sailcloth Company, Bath Street, Leith
220. Hayward R., & Co., Coker Works, Crewkerne, and 93 Minories, E.
219. Hayward, R., & Sons, West Chinnock and Tail Mill, Somerset
213. James, E. C.
215. Mitchell, A., & Co., Princes Square, Glasgow
217. Moore, W. F., & Son, Isle of Man
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597. Davidson, Pirie & Co., Leith, N.B. .....
556. Dickson & Renwick, 39 Lombard Street .....
619. Doull, G., Wick, N.B. .....
562. Edgar, J., & Co., 23 Rood Lane, E.C.....
573. Edmunds, J., 134 Pentonville Road .....
574. Flynn, D., Inch, Annascant, co. Kerry .....
609. Garriock & Co., Shetland .....
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610. Gillings, Jas., Havelock Road, Great Yarmouth ...
566. Gillon, John, & Co., Leith, N.B. .....
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585. Grahame, W. G., 131 High Street, Dunbar, N.B....
593. Gray, John, Whinnyfold, Ellon, N.B. .....
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628. Hall, J., 15 High Street, Kensington .....
637. Jacobs, J., 80 Lower Thames Street .....
572. King, Robert, 32 Sussex Place, S.W.....
591. Knowles, James, Stonehaven, N.B.....
559. Latham, A. W., & Co., 17 Philpot Lane, E.C. .....
630. Lawrence .....
580. McCombie, J., & Co., Peterhead, N.B.....
560. Maconochie Brothers, Lowestoft .....
589. Methuen, J., & Co., Leith, N.B. .....
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555. Moir, John, & Son, 148 Leadenhall Street, E.C.
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569. Overall, S., Son, & Co., 102 Lower Thames St
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553. Park, J. & T., Fraserburgh, N.B. .....
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264. Dickerson, J. E., 33 Peter's Lane, Liverpool
204. Dixon, Corbitt & Spencer, Gateshead-on-Tyne
7. Dyne & Evers, York Road, Limehouse, E.
209. Edgington, B., 2 Duke Street, London Bridge, S.E.
15. Hearder & Son, 195 Union Street, Plymouth
263. Hunter, H., 66 Cressingham Road, Lewisham
233. Ihlee & Horne, 31 Aldermanbury, E.C.
71. King, George H., 165 Great Portland Street, W.
Knox, W., Douglas, Isle of Man
6. Morris, C. W., Harbour View, Lowestoft
243. Patent Ferrule Company, Sheepcote Street, Birmingham
221. Shaw, J., Soho Street, Sheffield
256. Steele, H., School Hill, Macduff, N.B.
257. Walker, W., & Son, 22 Nether Kirkgate, Aberdeen


## FENDERS, HEMP, &c.


56. Steedman & McAllister, Cathcart Street, Glasgow


## FISH CURING APPARATUS.


552. Fishery Board for Scotland, Edinburgh


## FISH CULTURE.


786. Andrews, John, Westgate House, Guildford 151,
784. Armistead, J. J., Solway Fishery, Dumfries, N.B.
791. Ashton & Green, Limited, 15 Bury Street, St. Mary Axe, London, E.C.
738. Atkins Water Softening Co., Bouverie Street, Strand
771. Austen, A.
760. Bapty, S. L., 65 Blackheath Road, Greenwich, Kent
779. Berney, G. D., Morton Hall, Norwich
789. Bingham, G. T.
756. Bolton
790. Brown, J.
749. Cail, R., Newcastle-on-Tyne
787. Capel, C. C., Cray Fishery, Foots Cray, Kent 151,
752. Chambers, W. O., Lowestoft 151,
759. Clark, J., 17 Royal Exchange Square, Glasgow
765. Corbigny, de H., Mons., Auray, Morbihan
732. Cornilleau, L. Mons., La Trinite sur Mer, Morbihan
748. Curtin, Fergus, Mucknish Castle, Burren Oranmore, Ireland
775. Dilnot, G., Hayling North, Havant, Hants
737. Edan et Jardin, Mons., Auray, Morbihan
744. Edinburgh Museum of Science and Art, Edinburgh, Prof. T. C. Archer, Director
776. Erne Fisheries, Ballyshannon, co. Donegal

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729. Woodhouse
774. Woods, W. Fell, Gorse House, Forest Hill, S.E.
782. Young, A., Inspector, Salmon Fisheries of Scotland, 22 Royal Circus, Edinburgh

## FISHING LINES (DEEP SEA).

50. Arnold, J. W., 9 Park Street, Deal
201. Belfast Ropework Co. (The), Limited, Belfast, Ireland
29. Bink, J. H., & Co., South Rope Works, Wick
20. Brooks, C. & R., 10 Edgecumbe Street, Stonehouse, Plymouth
43. Davidson, G. & W., 18 Regent Quay, Aberdeen
16. Edinburgh Roperie and Sailcloth Co., Bath Street, Leith
35. Findlay, G., Whitehills, Banff, Scotland
52. Fordyce, J., Gardenstown, Banffshire
198. Frost Brothers, 11 London Street, E.C.
117. Hamilton, The Marquis of, 2 Belgrave Square, W.
205. Hawkins & Tipson, 52 & 53 Crutched Friars, E.C.
15. Hearder & Son, 195 Union Street, Plymouth
49. Hemming, T., & Son, Windsor Mills, Redditch
28. Hounsell, W., & Co., North Mills, Bridport
51. Jones, J., Queen Street, Filey, Yorks
30. Jones, W., 10 Eastbro, Scarborough
47. Leslie, J., Ropeworks, Macduff
206. London Steam Ropery Company, 12 Upper East Smithfield, E.
224. Love, J., & Son, Denburn Rope Works, Kirkcaldy, N.B.
6. Morris, C. W., Harbour View, Lowestoft
46. Paterson, A., 6 Highshore, Macduff, N.B.
23. Ross, J., Jun., Muchalls, near Stonehaven
21. Tarry Mill Company, Tarry Mill, by Arbroath, N.B.
42. Thompson, P., 9 High Shore, Macduff, N.B.
24. Watson, A., 26 Skene Street, Macduff, N.B.
25*a*. West, J., 31 Crook o' Ness Street, Macduff, N.B.
153. Whetham, S., & Sons, 40 Gracechurch Street, E.C.
44. Wood, J., Fish Curer, Cullen, N.B.

## FISHING TACKLE (SEA), FLOATS, HOOKS, RODS, &c.

458. Aldred, Thomas, 258 Oxford Street, London
427. Alfred & Son, 20 Moorgate Street, London
455. Anderson, R., & Son
447. Andrews, Thomas Leo, High Street, Uppingham
Barnett, J., Kirkwall, Orkney
475. Bartleet, William, & Sons, Abbey Mills, Redditch

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330. Helyear, T., West Street, Bridport
503. Hemming, T., & Son, Windsor Mills, Redditch
11. Hilton, W. H., 130 Victoria Street, Bristol
469. Hoban, William, Callan, Ireland
477. Holland, G.
467. Holroyd, E. A., 59 Gracechurch Street, London
473. Horne, Miss, Hampton Park, Hereford
472. Hotell, Belfield W., Bedford Street, Norwich
485. Howarth, Samuel, 184 & 185 Station Street, Burton-on-Trent
323. Hunter, H. L., 66 Cressingham Road, Lewisham, S.E.
488. Hunter, H. L., 66 Cressingham Road, Lewisham, S.E.
484. Hyde, W. Derby, Witney Oxon
325. James, H., 20 and 21 Windley Factory, Nottingham
396. Jones, Captain A. F., 2 Sandown Terrace, Chester
324. Jones, W., 10 Eastbro, Scarborough
30. Jones, W., 10 Eastbro', Scarborough
442. Kelson, G. M.
505. Kelson, George M., Colville Mansions, London, W.
454. Kinnair, W. K., 63 North Bridge, Edinburgh
53. Linton, A., 87 High Street, Edinburgh
428. Little, G. & Co., 15 Fetter Lane, London, W.C.
321. Lowdon, J., & Co., Fraserburgh, N.B.
468. McCarthy, Thomas William, St. Cashel, co. Tipperary, Ireland
478. Macnee, James, Loch Tummel Side, Pitlochry, Perthshire
471. Malloch, P. D., 209 High Street, Perth
317. Manchester Cotton Company, 51 Corporation Street, Manchester
438. Manchester Cotton Twine Spinning Company: Director, John Wilcock, 51 Corporation Street, Manchester
490. Martin, John William, 4 Northern Buildings, Lover's Lane, Newark-on-Trent
501. Marx, M., 4 Florence Villa, Woodland Road, Upper Norwood
446. Milne, William, 32 Back Wynd, Union Street, Aberdeen
430. Millward, A. G., & Sons, Waterford Mills, Redditch
505*b*. Moffat, A., 80 Belsall Heath Road, Birmingham
460. O'Fee, Daniel, Rasharkin, co. Antrim, Ireland
452. Ogden and Scotford, 7 Portland Terrace, Pittville, Cheltenham
420. Parker, William, Chairman of the Board of Conservators of the Eden Fishery District, Carlton Hill, Penrith
466. Patrick, Stephen Melton, 103 Westborough, Scarborough
486. Prag, Alexander Van & Son, 9 Crown Street, Soho, London, W.

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433. Wright, James, Sprouston, near Kelso, Roxburghshire, Scotland
465. Wright, Robert, 16 Princes Street, Edinburgh
459. Young, R., 1 Bredon Place, Besley Road, Redditch


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832. Arnold, E., Campbell Yard, High Street, Huntington
833. Arnold, J. W., 9 Park Street, Deal
834. Ashmead, G. B., & Co., 35 Bishopsgate Street, London, E.C.
947. Adams, W. A., Gaines, Worcester
835. Barber, W., 19 Sincil Street, Lincoln
836. Barr, B., 44 Hemsworth Street, Hoxton
837. Beasley, A. W., 14 Greville Place, Maida Vale, N.W.
Benningfield, D., Broxbourne, per Alfred G. Jardine
Bennyfield, W.
838. Bermondsey Brothers' Angling Club, Alscot Arms, Alscot Road, Bermondsey
839. Birmingham and Midland Piscatorial Association, 39 Vyse Street, Birmingham
943. Braine, F., Kensington
840. Brookwell, H. G., 15 Belmont Villas, Leyton Road, Leyton
841. Brotherston, A., Shedden Park Road, Kelso, N.B.
842. Brunton, John, M.A., M.D., 21 Euston Road, N.W.
843. Bunn, H. H., Palmerston House, Ventnor, Isle of Wight
948. Burton & Son, H. J., 191 Wardour Street, Oxford Street, London
844. Butler, J., "True Waltonian Society," "White Horse," 80 Liverpool Road, N.
845. Callaghan, J., 36 St. Mary at Hill, Eastcheap, E.C.
846. Careless, G. D., 52 Arundel Street, Landport, Portsmouth
847. Carr, W. P., High Street, Berwick-on-Tweed
848. Clifford, J. W., Three Colts, Cambridge Road, Bethnal Green
849. Coburn, F., Holloway Head, Birmingham
850. Convivial Angling Society, Bull and Bell, Ropemaker Street, Finsbury
851. Cresswell, H., "True Waltonian Society," White Horse, Liverpool Road, Islington, N.
Critchfield, A. C., 1 Pownall Road, Queen's Road, Dalston
949. Crowley, J. W., 28 Cloudesley Square, Islington, N. 175 and
852. Curtis, E., Jun., Mortimer Lodge, Upton, Essex
853. Day, Dr. Francis, Leamington House, Cheltenham
854. Da Costa, Hyman, 18 Peter Street, Tyssen Street, Bethnal Green
855. Davie, J. H., 49 Shaftesbury Road, Hammersmith, W.
856. Eastwood, G. J., Cheshunt, Herts
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903. Nutting & Co., 70 Edgbaston Street, Birmingham .....
904. Nuthall, A., Thames Street, Kingston .....
905. Pennell, H. Cholmondeley, 5 Cadogan Street, S.W.....
906. Pickhardt, G., 45 Crogsland Road, London, N.W. .....
907. Pugh, R. L., 16 Comeragh Road, West Kensington, W. .....
909. Piscatorial Society .....
908. Reading and District Angling Association, Great Western Hotel, Reading .....
910. Roberts, T., Castle Meadow, Norwich .....
911. Robinson, A., & Lowin, B. J., Edmonton and Tottenham Angling Society, Upper Edmonton, Middlesex.....
944. Rushbrook, G., 4 Ainger Road, Primrose Hill, N.W. .....
912. Sachs, A., 22 Hyde Park Place, London, W. .....
913. Sachs, F., 22 Hyde Park Place, London, W. .....
914. Sachs, T. R., 22 Hyde Park Place, London, W. .....
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915. Sayer & Co., 100 Lower Thames Street, E.C. .....
945. Scott, Harry, Forbes House, Surrey, 28 Belgrave Square ....
916. Scott, J. R. Knowle, F.S.A., The Drive, Walthamstow .....
917. Searle, E. W., 11 College Place, Great College Street, N.W..
918. Smith, D., 16 Guildford Street, Wilmington Square, Clerkenwell .....
919. Snowe, H., & Sons, Church Street, Inverness .....
920. Society of Caxtonian Anglers, The, Falcoln Hotel, Gough Square, Fleet Street .....
921. Soman, P., Argus Office, Norwich .....
922. Squire, Frederick W. W., 13 Radnor Place, Plymouth .....
923. Stanley Anglers' Society, 51 Camden Park Road, N.W. .....
924. Starkey, James, 28 Albion Road, Stoke Newington.....
925. South London Angling Society .....
925*a*. Sweeting, J., & Co., 159 Cheapside, London, E.C. .....
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538. Wilkinson, W. N., 15 St John's Road, Longsight
537. Willson, C., Grimsby
540. Yeatman & Co., 119 New Bond Street, London

## HARBOUR APPLIANCES.

413*a*. Bowman, J., 22 Square, Huntly, Aberdeenshire
413. Gillings, J., 19 Havelock Road, Great Yarmouth
410. Gordon, J., Jun., Maryfield, Dundee
411. Leeds, L. W., 38 Old Jewry, E.C.
413*b*. Rose, R. & Co., 72 Leadenhall Street, E.C
412. Teasdel, Wm., C.E., Harbour Works, Great Yarmouth
413*c*. Wilkins, F., 35 Poland Street, W.

## HARPOONS AND LANCES.

8. Berney, G. D., Morton Hall, Norwich
10. Fowler, W., Rose Street, Peterhead, N.B.
9. Henry, A., 12 South Street, Andrew Street, Edinburgh, and 118 Pall Mall, S.W.
12. Osborne, Charles & Co., 13 Whittall Street, Birmingham

## HARPOON GUNS (also Guns for Sealing).

8. Berney, G. D., Moreton Hall, Norwich
10. Fowler, W., Rose Street, Peterhead, N.B.
9. Henry, A., 12 South St. Andrew Street, Edinburgh, and 118 Pall Mall, S.W.
12. Osborne, Charles & Co., 13 Whittall Street, Birmingham

## INJURIOUS INSECTS.

825. Eedle, J., 40 Goldsmith Row, Hackney Road, E.
826. Thomson, J., 1 Main Street, Inverallochy, Fraserburgh, N.B.

## LAMPS, LANTERNS, AND LIGHTING APPARATUS.

245. Bowman, J., 22 Square, Huntly, N.B.
250. Bryer, J. & Son, 104, Minories, E.C.
249. Clarbour, F., 150 Wellington Street, Glasgow
244. Heron, T., London Road, Manchester
227. Hughes, H. & Son, 59 Fenchurch Street, E.C.
258. Lucas, J. & Son, Little King Street, Birmingham
242. Pitley, W., Jun. & Co., Birmingham
259. Trotter, J. & Co., 7 Great Winchester Street Buildings, E.C.
239. Whitfield, Haker, & Lamb, Commercial Road, Hull

## LAMPS OF ALL KINDS.

275. Bishop, E., Portland Road, South Norwood
305. Drew & Cadman, 245 and 246 High Holborn, W.C.
282. Nunn, W. & Co., Neptune Works, 204, 205 and 206 St. George Street, E.
283. Siebe, Gorman & Co., 187 Westminster Bridge Road, S.E.
292. Thomas, E. C. G., National Club, Whitehall Gardens

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1003. Arnold, J. W., 9, Park Street, Deal
1004. Barnet, J., Kirkwall, Orkney
1005. Bates, W., "Land and Water," 176 Fleet Street, E.C.
1006. Capel, C. C., Cray Fishery, Foot's Cray, Kent
1029. Chambers, W., Oldham, Norfolk and Suffolk Fish Accli tization Society, Lowestoft
Crane, John, Ramsey
Dean, G. A., Douglas
1007. Exeter, Marquis of, Burghley House, Stamford
1008. Fishery Board for Scotland, Edinburgh
1009. Forster, D. & W. H., Ashbourne Derbyshire
1010. Gresham Angling Society, Mason's Hall Tavern, Basin Street, E.C.
1011. Gunn, T. E., 47 St. Giles Street, Norwich
1012. Harding, C. W., Assoc. M. Inst. C.E., King's Lynn, No
1013. Holdsworth, E. W. H., 40 Pall Mall, London, S.W.
1014. Hore, J. P., 40 and 41 Bloomsbury Street, W.C.
1015. Inspectors of Irish Fisheries, Dublin Castle, Dublin
Insular Government, Isle of Man
1016. Jarrold & Sons, Messrs., 3 Paternoster Buildings, Lond
Lewis, Abel, Douglas
1017. Lovell, M. S., Catke Abbey, Derby
1018. Loynes, J., Elm Hill, Norwich
1019. Mackenzie, W., 69 Ludgate Hill, London, E.C.
Moore, A. W., Esq.
1020. Olsen, T., Fish Dock Road, Grimsby
1021. Olsen, O. T., Fish Dock Road, Grimsby
1022. Pennell, H. Cholmondeley, 5 Cadogan Terrace, S.W.
1023. Sampson Low, Marston & Co., 181 Fleet Street, Londc
1024. Satchell, W., 19 Tavistock Street, W.C.
1025. Smith John, Beighton House, Winchester Road, Kilbu
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1027. Tulloch, C., 12 Rodolph Road, Maida Hill, W.
1028. Wilkins, F., 55 Poland Street, London, W.

## MACHINERY IN MOTION.

718. Abbot, J. & Co., Newark-on-Trent
701. Bateman, Alf., & Co., East Greenwich, London
709. Beck, J. & Co., 130 Great Suffolk Street, Southwark,
705. Bell-Coleman Refrigerating Company, 45 West Nile S Glasgow
696. Barton, C. E., Providence Works, 56 & 58 Eastgate, Grimsby
699. Brooke, J. W., Adrian Works, Lowestoft
715. Clark, Bunnett & Co., 150 Rathbone Place, London, W
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6. Morris, C. W., Harbour View, Lowestoft
34. Read, George, Byrom House, St. Patrick's Road, Deal, Kent 1
38. Shepherd, H. C. W., Hull House, Raglan Street, Lowestoft 1

## OBJECTS EXHIBITED IN THE GROUNDS.

1039. Anglo-Norwegian Guano, Phosphate & Isinglass Co., Limited, Dashwood House, New Broad Street, E.C.
1051. Bartlett, A. D., & Son
1047. Burgoine, C. & A., Kingston on Thames, Surrey .... 209 & 21
1034. Clarke, Bunnett & Co., Limited, Rathbone Place, London
1038. Humphreys, J. C., Albert Gate, High Road, Knightsbridge
1046. Manufacturers' and Millowners' Association
1035. Priestmann, Bros., 52 Queen Victoria Street, London, E.C., and Holderness Foundry, Hull
1048. Severn Fisheries Board, Mr. Willis Bund, Hon. Sec.
1030. Silk, W. T., for the Marquis of Exeter, Burghley Park, Stamford
1049. Thomas, E. C. G., National Club, Whitehall

## OILS, MANURES, AND OTHER PRODUCTS PREPARED FROM FISH.

660*a*. Anglo Swedish Co., Limited, 23 Old Change, E.C. 1
657. Blundell, Spence & Co., Limited, 9 Upper Thames Street, E.C. 1
655. Carr, Wm. Graham & Son, 63 High Street, Berwick-on-Tweed 1
658. Dales, J. T., 287 Crystal Palace Road, S.E. 1
656. Laughrin, W., Polperro, Cornwall 1
659. Linton, R. T., 8 Nicholson Street, Edinburgh 1
660. Sinclair, Wm., Drumbeg, Donegal 1

## ORNAMENTAL AND USEFUL PREPARATIONS FROM FISH AND AQUATIC ANIMALS.

661. Abrahams, A., Crystal Palace, Sydenham, S.E. 1
667. Borough Leather Warehouse Company, The, 134, High Street, Southwark, London, S.E. 1
662. Biglioschi, V., 101 Ledbury Road, Bayswater, London, W. 1
601. Brassey, Lady, Normanhurst Court, Battle 1
674. Cresswell, Red Lion Square, London 1
686. Davidson, J., Wick, N.B. 1
689. Davies, S., 50 Fann Street, Aldersgate Street, E.C. 1
669. Davis, A. A., 46 Buckingham Road, Southgate Road, London, N. 1
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59. Softly, R. T., King Street, Great Yarmouth
46. Paterson, A., 6 High Shore, Macduff, N. B
70. Paterson, G., 4 Market Street, Macduff, N.B.
69. Perrin, C., Selsey, near Chichester
61. Plummer, L., Sandside, Scarborough
68. Saunders, G., Selsey, Chichester
76. Schreiber, C. G. von, St. Margaret's College, Lowestoft
73. Thomas, J. J., & Co, 87 Queen Victoria Street, E.C.
74. Thomson, W., 8 Lowshore, Macduff, N.B.
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# INDIA.

In a tropical country, such as India, the economic value of well-stocked fisheries depends greatly upon two considerations. First whether a sufficient local demand for fish exists, which will yield a fair remuneration to the fishermen for their outlay on the necessary gear and labour in securing the finny tribes. Secondly, provided such demand is insufficient, whether facilities are present which will enable them to send their surplus captures in a marketable condition to more distant localties.

Consequently it becomes necessary first to observe upon what proportion of the people of India and Burma consume fish as food, or rather are able to do so without infringing caste prejudices. In the Punjab comparatively few of the inhabitants are thus prohibited, although Brahmans and the rural population in some places reject it, but among the residents of hilly districts and towns its consumption is only limited by the paucity of the supply and the cost of the article. In the North-West Provinces, Haiderabad, Mysor, and Coorg, more than half the population are permitted by their religion to consume fish. In Oudh the majority can do so. In Sind nearly all except the Brahmans; in Bombay by far the largest proportion of the people; in South Canara 89 per cent.; in Madras the majority, the exceptions being Brahmans, Goldsmiths, high-caste Sudras, the followers of Siva, Jains, &c.; in Orissa more than half the people; in Bengal proper from 90 to 95 per cent; in Assam and Chittagong almost the entire population, and in Burma in the form of Nga-pae its use is universal.

In investigating how the local markets were supplied with fish up to 1873, the replies from native officials gave the following results. In the Punjab one in ten markets were sufficiently supplied, in the North-West Provinces one in three, in Oudh one in four. In Bombay the amount was stated to be insufficient in all and the same reports came from Haiderabad, Mysor and Coorg. In Madras, near the sea, the quantity of fish was sufficient, but only in one out of the ten inland markets. In short merely one-tenth of the bazaars were reported as fully supplied with fish, and of these one-fifth obtained them from the sea-coast.

The fishermen in several parts of India, more especially in the Madras Presidency, have customs of a patriarchal character, which are more strictly adhered to on the Coromandel than on the Western coast, but they appear to be falling into disuse. In Madras there are three classes of headmen, the superior or priestly, whose office is hereditary, and he exercises control over large tracts of country; the next is likewise hereditary, his jurisdiction being limited to a few towns and villages. The lowest form is elective, and he is over one village or street.

The sea-fishermen in olden times are stated to have been divided into two distinct clases. (1) Those who captured fish in the sea beyond their own depth; and (2) those who fished from the shore or in the backwaters, and were more immediately concerned in fish-curing and fish-vending. Remains of these two classes are still existing in Ganjam and elsewhere, but generally the deep-sea

fishermen have taken to the cheaper mode of plying their occupation close in-shore.

The condition of the sea fishermen in Sind about ten years since, when investigations were made, showed that they were fairly well off; miserably poor in Bombay, except in the vicinity of large towns; in a prosperous condition from South Canara down the Western coast of the Madras Presidency, but once round Cape Comorin they again appeared as a poverty-stricken race of people, and continued so up the Coromandel coast, except when residing near large centres of population.

The sea-board of India and Burmah extends for about 4,611 English miles, and the seas are much more abundantly stocked with fish than are those of Europe, consequently it appears strange why the majority of the sea-fishermen should be badly off, considering the almost unlimited inland market for fish which exists. A long investigation led to the conclusion that the fisheries were in a depressed condition wherever salt was expensive or the employment of untaxed salt-earth prohibited, as in Bombay, along the Coromandel coast of Madras and the Bay of Bengal. That they were flourishing where salt was cheap or the use of untaxed salt-earth permitted, as in Sind, the Western coast of Madras and Burma. That where untaxed salt-earth could be obtained the superior quality of salt was rarely purchased for fish curing. That (with the exception of Sind and Burma) where the use of salt-earth was prohibited, the fish-curer had to dry his fish in the sun, or purchase monopoly salt, while the sole way to keep down the cost of this latter description of cured fish was to pay the very lowest possible price for the fishermen's captures and employ a minimum amount of salt.

Prior to considering the incidence of the salt tax upon the fish curers' and fishermen's trade, I would draw attention to the following figures, which show, as far as returns are available, the amount of salted and dried fish *exported* by sea from Indian ports. The value is given in pounds sterling, calculating 1 rupee at 2 shillings.

| Five years ending | From Sind. Value in £. | From S. Canara. Value in £. | From Malabar. Value in £. | From Coromandel Coast. Value in £. |
|---|---|---|---|---|
| 1857–58 | 8,472 | No returns. | No returns. | No returns. |
| 1862–63 | 13,064 | " " | 26,272 | " " |
| 1867–68 | 18,725 | 6,969 | 48,207 | 1,753 |
| 1872 73 | 22,944 | 14,921 | 90,849 | 4,513 |

The duty on salt in Sind has been 2*s.* a maund of 82⅔ lb. avoirdupois, sometimes less, during the entire period comprised in the above table. The first great increase in salting fish occurred in 1860-61, in which year the salt duty was raised in Bombay from 2*s.* to 2*s.* 6*d.* a maund. The next spurt of this trade in Sind was in 1864–65, when the salt duty was again raised in Bombay from 2*s.* 6*d.* to 3*s.* a maund. Possibly the importations into Bombay from Sind would subsequently have been more, but Government decided in 1867 to admit all salt fish from foreign ports, where no salt duty exists, into British India free of duty, to the immense advantage of the Portuguese settlements and the Meckran coast, but completing the ruin of Indo-British fishermen and fish-curers unless they were advantageously located.

The following table from different districts on the west or Malabar coast of

Madras shows the annual sale of Government or monopoly salt, along with the value of the salted and dried fish which were exported by sea:—

| | South Canara. | | Cannanore. | | Tellicherry. | | Travancore and Cochin. | |
|---|---|---|---|---|---|---|---|---|
| Years. | Fish. Value in £. | Salt sold. Maunds. | Fish. Value in £. | Salt sold. Maunds. | Fish. Value in £. | Salt sold. Maunds. | Fish. Value in £. | Salt sold. Maunds. |
| 1863—1864. | 1,057 | 191,002 | 96 | 11,653 | 1,459 | 72,505 | 5,416 | 728,268 |
| 1864—1865. | 3,036 | 168,279 | 219 | 7,932 | 1,504 | 57,516 | 6,052 | 643,897 |
| 1865—1866. | 875 | 184,174 | 11 | 9,856 | 194 | 62,135 | 7,061 | 672,370 |
| 1866—1867. | 1,124 | 151,113 | 12 | 9,728 | 1,825 | 57,381 | 7,337 | 497,988 |
| 1867—1868. | 875 | 174,629 | 303 | 8,721 | 2,011 | 56,502 | 7,803 | 558,766 |
| 1868—1869. | 114 | 176,465 | 520 | 9,045 | 4,319 | 63,340 | 7,130 | 573,639 |
| 1869—1870. | 2,053 | 147,173 | 4,340 | 8,807 | 5,839 | 72,616 | 6,096 | 574,119 |
| 1870—1871. | 3,927 | 136,967 | 1,470 | 7,932 | 5,301 | 57,624 | 5,833 | 593,389 |
| 1871—1872. | 2,845 | 177,482 | 695 | 12,008 | 5,340 | 88,674 | 6,987 | 577,268 |
| 1872—1873. | 5,980 | 135,839 | 951 | 6,985 | 8,429 | 77,332 | ? | ? |

The above table shows that the amount of annual exports of salt and dried fish in Western India had very little if any connection with the quantity of monopoly salt which was disposed of, the explanation being that the people were permitted to use the salt-earth in the preparation of fish as in accordance with a legal decision the natives were free to collect this salt-earth for their own consumption. Previously three maunds of fish required 4*s.* worth of monopoly salt for its cure, but 4*d.* worth of salt-earth was found sufficient for this purpose. The article produced was inferior, but it was brought within the reach of the poor. It was proposed to impose a tax of a little more than 3*s.* 6*d.* a maund (R. 1 13 annas) on this salt-earth.

The salt tax in Madras in 1858–59 stood at 2*s.* a maund, but has been raised as follows:—1859–60 to 2*s.* 9*d.*, 1860–61 to 3*s.*, 1864–65 to 3*s.* 4½*d.*, 1869–70 to 4*s.* 1875 to 6*s.* But in Madras some facilities are now being given to the salting of fish.

Fresh-water fisheries differ in many material respects from marine ones, and wherever any quantity of water is present in the East there we are almost certain to find fishes, and this from a sea-level to nearly the summit of the highest mountains. As a natural consequence fishing is carried on in rivers, irrigation canals, tanks, ditches, inundated fields and swamps. The fishermen of the fresh waters are divisible into two main classes; first such as follow this calling as their sole means of livelihood, and secondly such as engage in it only occasionally and as a subsidiary occupation. Of the first class, even within the limits of a single or at least of a few generations, great innovations have crept in, for in the time of native rule fishing was in the hands of distinct castes, but now it is only here and there that one comes across some remnant of these people, who still restrict their means of livelihood to this industry. British rule in most places has given up taxes on fishermen, and in many districts fishing rights as well, consequently there are few large contractors who are lessees for lengthened periods of such properties, and it is no one's business to prevent undue depletion of fisheries. In some districts the fisheries, or a portion of them, are declared free, but a licence tax is imposed on fishermen. Or the general public may take fish for home consumption, but not for sale. Or liberty is given for everyone to help himself as he likes, where he likes, and when he pleases.

At first the public, pleased at the remission of rents and the removal of restrictions, employ redoubled energy, and thus augment their immediate profits, the markets become glutted, but soon the price declines. After two or three years fish become scarcer, fishing is no longer remunerative, and the misapplied energy eventuates in nothing but small fish remaining.

Among the artificial causes deleteriously affecting fisheries in many districts are irrigation works, which are formed by throwing a weir across a river and diverting a large amount of water down a main irrigation canal. Fish migrating down rivers pass into these canals, where considerable falls exist, but they can never reascend to the river. Thus these canals become enormous fish-traps, wherein all the finny tribes are destroyed whenever the canals are run dry in order to see what annual repairs are required. Similarly all fish passing into the side channels, which are generally flooded every alternate week, become killed, as no refuge tanks are in connection with these canals. Sometimes irrigation is carried on by means of diverting entire rivers into *paddy* fields, in which case all the fry they contain perish.

As soon as young fish are moving about, or shortly after the monsoons have set in, men, women and children obtain myriads of fry from paddy fields and every sheltered spot to which they have retired for shelter and security. Nets which will not permit a mosquito to pass are employed; the sides of rivers are denuded of fish so far as human agency can contrive it. The agricultural population construct wickerwork traps, baskets and nets, first placed so as to entrap the breeding fishes ascending to their spawning grounds, and subsequently reversed to take them descending to the river. Streams are absolutely strained to capture the fry, and every irrigation channel has its wickerwork trap. These devices are too numerous to describe.

The minimum size of the mesh of the nets employed in fresh waters is exhibited in the following return:—

| Return from | Size in inches between knot and knot in meshes. | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | 1 inch. | Below 1 inch. | ¾ inch. | $\frac{1}{2}$ | $\frac{3}{8}$ | $\frac{1}{4}$ | $\frac{1}{8}$ | $\frac{1}{16}$ | $\frac{1}{32}$ | $\frac{1}{64}$ | $\frac{1}{128}$ | $\frac{1}{256}$ |
| 91 native officials | 5 | 5 | 18 | 5 | 24 | 1 | 5 | 18 | 4 | 2 | 3 | 1 |

And out of 70 more returns 53 officials compared the size of the mesh to a grain of wheat, mothi, mucca, gram, dholl, lamp-oil seed, barley, tamarind seed, a small pea, a peppercorn, a large needle, a bodkin, quill, coarse muslin, will ensnare a gnat, or hardly anything will pass.

The meshes of nets vary with the season of the year and the growth of the fish. Rivers are dammed and diverted for fishing; waters are poisoned for this purpose, and many other plans are pursued which want of space will not permit me to enumerate.

FRANCIS DAY.

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[*Up to the time of going to Press with the First Edition, the List of Exhibits for India had not been received.*]

# BAHAMAS.

*[Up to the time of going to Press with the First Edition, the Official Introduction to the Exhibits from Bahamas had not been received.]*

## CLASS I.—SECTION I.

## FISHING.

[SEA FISHING.]

### DIVISION I.

**Gear of every description and of all nations used in trawl, herring, long line, hand line, and every other mode or system of fishing, including all nets, lines, hooks, harpoons, tackle, &c., employed in the same.**

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Sponge Staff with Hook attached, used in obtaining large sponge.
Sponge Staff with Hook attached, used in obtaining smaller sponge.
4 Staffs with Harpoon attached, used in turtle-fishing.
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Two Specimens of Water Glasses.
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Segment of a Fish Net.
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Model of Fishing Smack.
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**Ropes and canvas suitable to fishing vessels.**

**CENTRAL COMMITTEE**, Nassau.
Specimens of Rope used by fishing vessels, manufactured from the Palmetto.

---

CLASS II.

ECONOMIC CONDITION OF FISHERMEN.

**Apparel and personal equipment.**

DIVISION XXI.

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Pair of Palmetto Shoes.

---

CLASS III.

COMMERCIAL AND ECONOMIC.

DIVISION XXVI.

**Preparation, preservation, and utilisation of fish, and all forms of life included in Class V.**

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ii. Fish dried, smoked, cured, salted, tinned, or otherwise prepared for food.

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Cameos—Shell Ornaments.

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Diamond Shell and Scroll Head Ornament, with fine Pink Pearl in centre.
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Fine Pink and White Pearl and Diamond Double Heart Centre Bracelet, Diamonds on shoulders.
Large Pink Pearl and Diamond Rose-bud Spray Brooch.
Pink, Yellow, and White Pearl and Diamond Triple Rose-bud Brooch.
Pink, White, and Black Pearl and Diamond Bouquet and Bird Brooch.
Pink and White Pearl and Diamond Spray Brooch.
Pink Pearl and Diamond Spray Brooch.
Pink Pearl and Diamond Dragon Fly Brooch.
Two Pink Pearl and Diamond Rose-bud Spray Brooch.
Large Diamond Butterfly, with Pink Pearl body.
Pink and White Pearl and Diamond Spray Brooch.
Pink and Black Pearl and Diamond Double Heart Ring.
Pink and White Pearl and Diamond Double Heart Ring.
A fine Pink Pearl and Diamond Cluster Ring.
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## Division XXXII.

iv. Preparation and application of sponges, corals, pearls, shells, and all parts and products of aquatic animals, &c., to purposes useful and ornamental, with specimens.

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Polished Hawksbill Turtle Back.
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Cross of native shell work.
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Box containing Jewellery manufactured from shells and fish scales.

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Specimens of Sheep Wool or Carriage Sponge.
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Specimens of Ordinary Velvet.
Specimens of Reef.
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Specimens of Yellow.
Specimens of Grass.
Specimens of Glove.

The Sponge Trade.—From a report by the American Consul at Nassau, we learn that the sponge trade gives employment to several thousand persons and some hundreds of vessels, the sponges being divided into coarse and fine, of which the former brings in about $5 per cwt., and the latter double that sum. The principal varieties, in the order of their value, are known as sheep-wool, white reef, abaco velvet, dark reef, boat, hardhead, grass, yellow, and glove; and of some of these varieties there are several grades, designated by numbers, all being used for mechanical, surgical, and bathing purposes. Bahama and Florida sponges are about equal to texture and value, but both are inferior to those of the Mediterranean. The vessels employed in sponging are small, with crews of from six to twelve men. About six weeks' provisions are taken on board, and they then coast along the banks and reefs, where the water is shallow and generally so clear that the sponges are readily seen and are brought to the surface by hooked poles or sometimes by diving. When first brought up they are covered with a soft gelatinous substance as black as tar and full of organic life, the sponge as we know it being only the skeleton of the organism. The day's catch is spread out on the deck so as to kill the mass of animal life, which in dying emits a most unpleasant smell. Then the spongers go ashore and build a pen or "crawl" of stakes close to the water's

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FOR DRIVING, RIDING, SHOOTING, FISHING, WATERPROOFS FACTORY, BUTCHERS, AND GENERAL WEAR.
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WORKS: LIMEHOUSE, E.

so that the action of the tide may wash away the black covering, in it is aided by pounding the sponges with sticks. When this opera- completed the sponges are strung upon small palmetto strips, three r to a strip, which is called "a bead," when they are taken to Nassau sold in the sponge market under certain conditions and regulations, y being allowed to sell his cargo otherwise than through this sponge nge. On the conclusion of the sale the sponges are taken to the ng yard, where they are sorted, clipped, soaked in tubs of lime-water, pread out to dry in the sun. They are then pressed by machinery ales, containing 100 lbs., and in this state are shipped to England or Inited States, which of late years is almost the largest customer for ma sponges. The export has been gradually increasing, for whereas 74 it only represented $76,500, last year it amounted to $150,000, and ear before to $168,000. A new sponge field was discovered last year Island of Eleuthera, 60 miles from Nassau, extending over an area of miles, and yielding the sheep wool, the most valuable quality. Not- tanding this fact, there have been two drawbacks to working this one being, though the sponges are of a very large size, they are dingly tender in the inner portions, and will not cut to advantage; ther, that at certain times of the year myriads of small fish, known as ors," arrive at the field and stir up the muddy bottom to such an t that not a single sponge can be seen.

**AL COMMITTEE,** Nassau.
ot Skins.

---

## CLASS V.

## NATURAL HISTORY.

[AQUARIA.]

### DIVISION XLIII.

**ens living (marine and fresh water), fresh, stuffed served, casts, drawings, and representations of—**

(*b*) Sponges, in their natural state.

**ERS, S. P.**
imens of curious Sponge Growths.

### DIVISION XLIV.

(*c*) Corals in their natural state, polyps, jelly-fish, &c.

**ERS, S. P.**
imens of Corals.

**L, JOHN.**
imens of Brain Coral.
imens of Branch Coral.

**L, WILLIAM.**
imens of Brain Coral.

**TS, ADMIRAL.**
imen of Brain Coral.

### Division XLVI.

(*e*) Mollusca of all kinds and shells not included in Class III.

**SAUNDERS, S. P.**
Collection of Bahama Shells.

### Division XLVII.

(*f*) Starfishes, sea-urchins, holothuriæ.

**SAUNDERS, S. P.**
Specimens of Starfish.
Specimens of Sea-urchins.
Specimens of Sea Fans and Feathers.

**BETHEL, JOHN.**
Specimens of Sea Fans and Feathers.

### Division L.

(*i*) Crustacea of all kinds.

Sea Crabs.
Do. (small).

### Division LI.

(*k*) Fish of all kinds.

**SAWYER, R. H., & CO.**
Jaw and Backbone of Shark.

**BETHEL, WILLIAM.**
Backbones of Sharks.
Skin of Nursefish.

**BETHEL, JOHN.**
Loggerhead Turtle back.

# BRITISH COLUMBIA.

*p to the time of going to Press with the First Edition, the Official Introduction to the Exhibits from British Columbia had not been received.*]

## PARTIAL LIST OF EXHIBITORS.

### Division I.

**Gear of every description and of all nations used in awl, herring, long line, hand line, and every other mode r system of fishing, including all nets, lines, hooks, harpons, tackle, &c., employed in the same.**

Long Poke Net, for taking Oolahans, of ingenious construction, composed of nettle fibre (*urtica cannabina*).
Scoop Net for Oolahans.
Trawl, with twenty-four smaller spring hooks, with casting line complete, of native material.
Lines for deep-sea fishing of different materials, including cedar-bark, pine-root, and kelp.
Whaling Gear.
Spring Fish Hooks for the capture of Cod.

### Division IV.

**Fishing craft of all nations; models and representations of the same.**

(ii.) Fishing Vessels and Boats other than Steam Vessels.

A Fishing Canoe (Cedar) adapted for four paddlers, with paddles, sealing spear, &c., complete, all neatly finished and ornamented.

ANDERSON, ABBOTT, & ANDERSON'S
BOOTS, TROUSERS, STOCKINGS, FISHING BROGUES, BAGS, COATS.
ARE UNEQUALLED.

DIVISION XIII.

**Salmon nets and all fixed appliances for catching salmonidæ in all their varieties.**

Large Scoop Net (with draw), for Salmon, made of Indian Hemp.

DIVISION XIV.

**Salmon rods, reels, lines, artificial flies and baits, gaffs, spears, creels, &c.**

Spears and Gaffs of different kinds.

DIVISION XVI.

**Pike, barbel, and other coarse-fish rods, reels and tackle, artificial spinning baits, &c.**

Rods, Reels, Lines, &c.

DIVISION XVIII.

**Hooks, &c.**

Native Fish Hook—many patterns.

DIVISION XXVI.

**Preparation, preservation, and utilisation of fish, and all forms of life included in Class V.**

(*a*) For edible purposes—
ii. Fish, dried, smoked, cured, salted, tinned, or otherwise prepared for food.

Canned Salmon of various brands, from twenty canneries.
Dried Fish, including Salmon, Oolahans, Halibut, &c., &c.

DIVISION XXIX.

(*b*) For other than edible purposes—
i. Oils, manures, and other products prepared from fish.

Fish Oils.
Fish Guano.

LADIES' WATERPROOFS
In French Tweeds. Very Light and Elegant.
ANDERSON, ABBOTT, AND ANDERSON,
37, Queen Victoria St., London, E.C.

DIVISION XLIII.

**Specimens living (marine and fresh water), fresh, stuffed, or preserved, casts, drawings, and representations of—**

(*b*) Sponges, in their natural state.

Sponges.

DIVISION XLVI.

(*e*) Mollusca of all kinds and shells not included in Class III.

Divers Shells.

DIVISION L.

(*i*) Crustacea of all kinds.

King Crab and Common Crab.
Crustacea, &c., &c.

DIVISION LI.

(*k*) Fish of all kinds.

A number of fishes in alcohol, including varieties of the Rock Cod (Sebastes), the Viviparous Perch, Oolahans, Herrings, Smelts, &c., and many peculiar to the Province.

DIVISION LVI.

**Specimens and representations illustrative of the relations between extinct and existing fishes.**

Photographs of various fishes.

ANDERSON, ABBOTT, & ANDERSON'S
FISHING TROUSERS
Are unequalled for Quality, Finish and Wear.
37, QUEEN VICTORIA ST., LONDON, E.C.

# CEYLON.

[*Up to the time of going to Press with the First Edition, the Official Intro to the Exhibits from Ceylon had not been received.*]

## LIST OF EXHIBITS.

### FISHING.

[SEA FISHING.]

DIVISION I.

**Gear of every description and of all nations us trawl, herring, long line, hand line, and every other or system of fishing, including all nets, lines, hooks poons, tackle, &c., employed in the same.**

Model No. 9.
Sinhalese, Karakgediya.
Tamil, Karappa.

A circular wickerwork coop, about 3 feet in heigl about 5 feet in circumference at the bottom; the circ ence diminishes towards the top, where it is only suffi large to admit a man's arm. It is used in shallow wat principally at night. A torch, or chool light, is carri boat, while the coop is carried by a man wading in the who, when the fish, attracted by the bright light, com drops the coop down on them, and then withdraws through the opening at the top.

ANDERSON, ABBOTT, AND ANDERSON,
PATENTEES & SOLE MANUFACTURERS OF THE REGULATION WATERPROOF

GENTLEMEN, HORSE GUARDS, 10th March.

The Waterproof Coat made by you has been approved of as a pattern for Coats to be worn in w by all officers.—The Material seems excellent, and is exactly what was recommended by the Committee. It has been now sealed and deposited at the Horse Guards.—I am, Gentlemen, yours obediently, ARTHUR A.A.G., Col.—N.B.—A General Order on the subject will be issued in next month's orders.

G. O. 28. OFFICERS' DRESS.

A Waterproof Cloak has been approved of for Officers on duty in wet weather. The pattern has been deposited at the Horse Guards. It is optional with Officers to provide themselves with this Cloak; the Waterproof Overcoat is to be worn on duty.

37, QUEEN VICTORIA STREET, E.C., LONDON, ENGLAND.

Model No. 10.
Sinhalese, Iratiya.
Tamil, Thin pidipei.

This is a trap somewhat similar to the "Karakgediya," but with no opening at the taper end. At this end is a contrivance with a trap door, allowing easy entrance but difficult exit. It is fixed in the narrow channels where water is drained from one land to another.

Model No. 11.
Sinhalese, Kumbala Dela.
Tamil, Kumbala Wali.

This net is about 100 yards long and 6 yards in depth. It is cast about four miles out at sea, to catch a species of fish called Kumbaliwa, about the size of herrings.

Model No. 12.
Sinhalese, Suda Dela.
Tamil, Suda Wali.

This net is about 45 yards long and 6 yards in depth. It has a bag or noose at each of its four corners. It is taken by boat about 30 yards out to sea, whence two men swim ashore carrying each end of it. It is then hauled up on to the beach.

Model No. 13.
Sinhalese, Pulunnan Dela.
Tamil, Chithippu Wali.

This net is 125 yards long and 7 yards in depth.

Model No. 14.
Sinhalese, Athanguwa.
Tamil, Pari.

A species of landing-net. Used also for catching prawns in the mud of lakes.

Model No. 18.
Sinhalese, Wisidel.
Tamil, Wisi wali.

This net is 3 yards in depth and about 6 yards in circumference at its mouth. One end tapers to a point and has a long string attached to it. The other end or mouth is heavily weighted with lead, so that when thrown on the water it falls on the surface in a circular form, and while sinking to the bed

LIFE BELTS AND VESTS.
No person should venture to Sea without them.
ANDERSON, ABBOTT, AND ANDERSON,
37, QUEEN VICTORIA STREET, LONDON, E.C.

of the stream or lake, encircles any fish that may be within its area. The string at the top end of the net then being pulled, the weights are gradually drawn together and the fish enclosed.

DIVISION IV.

## Fishing craft of all nations; models and representations of the same.

ii. Fishing vessels and boats other than steam vessels.

Model No. 1.
Sinhalese, Weladan Oruwa.
Tamil, Yawāre Thoni.
About 20 feet in length. Principally used, as its name signifies, for trading purposes.

Model No. 2.
Sinhalese, Warakau Oruwa.
Tamil, Kachchana Thoni.
A fishing-boat, mostly used during the north-east monsoon, from which it derives its name. Requires a crew of four men, and fishes with hook and line from between twenty to forty miles out at sea.

Model No. 3.
Sinhalese, Hinguran Oruwa.
Tamil, Hinguran Thoni.
This boat gets its name from the species of small fish generally used on board it for bait. It carries a crew of seven fishermen, and fishes with hook and line from five to ten miles out to sea. Net No. 3 is used to catch the particular bait required; it is 12 yards square.

Model No. 4.
Sinhalese, Issan Oruwa.
Tamil, Iral Wali.
Fishes with hook and line, using prawns for bait, from which it has the name "prawn boat."

Model No. 5.
Sinhalese, Laggan Oruwa.
Tamil, Surruku Wali Thoni.
Fishes with net (No. 5) of about 20 yards long and 40 yards

ANDERSON, ABBOTT, & ANDERSON'S
FOR GARDEN USE. HAMMOCKS FOR TOURISTS' USE.
37, QUEEN VICTORIA ST., LONDON, E.C.

in circumference at its mouth. It carries a crew of five men, and catches large shoals of fish not unlike sardines or pilchards.

Model No. 6.
Sinhalese, Kattu del Oruwa.
Tamil, Kattu Wali Thoni.

Is used for fresh-water fishing only. Derives its name from the net it carries, viz., stake net (No. 6), so called from the manner in which it is fastened in the current of a stream. The net is in the shape of a bag, 25 yards long, and with a mouth 4 yards in diameter. The mouth is fixed to eight stakes, placed in the bed of a stream in a semicircular form, at a distance of 1½ feet apart. Fishing with this net is generally carried on at night by torchlight.

Model No. 7.
Sinhalese, Kakuluwan Oruwa.
Tamil, Naudu Thoni.

This boat is 6 feet long, and is principally used for crab and prawn fishing in salt-water lakes. Baited lines are attached to long poles placed upright in the mud. When it appears from the line that a crab has caught hold of the bait, the boat comes near, and the line is gently drawn towards a net called "Athanguwa" (No. 14), into which the crab is shaken.

Model No. 8.
Sinhalese, Modduwa Oruwa.
Tamil, Koduwä Thoni.

Derives its name from a species of large fish called "Modda." It is caught with hook and line, but on account of its weight requires to be taken on board in the net "Athanguwa," No. 14.

Model No. 15.
Sinhalese, Kattumaran.
Tamil, Ditto.

This is a common description of raft; it is made of three or four logs of wood, about 6 feet in length and 2 feet in circumference, kept together by pieces of wood run through them in three places, with the ends of each piece projecting at either side. Ropes made fast to these ends, passed over from side to

ANDERSON, ABBOTT, and ANDERSON'S
INDIA-RUBBER MATS.
VERY SUITABLE FOR
SHIPS, YACHTS, STEAMERS, CARRIAGES, ETC.

side of the raft, keep the logs firmly fixed together. The net (No. 15) used by this craft is about 30 yards long and 6 yards in depth, and is usually cast not more than three miles out at sea.

Model No. 16.
Sinhalese, Mādel paruwa.
Tamil, Kawali pathei.

This is a flat bottomed boat, plied with oars and poles. It derives its name from the Mādel net which it carries. This net is 600 yards in length and 20 yards in depth. In casting this net one end is firmly fixed on shore, while the other, after the net has been paid out from the boat in a straight line out to sea, is gradually brought round to the shore at a point about 40 yards distant from where the other end is made fast. Both ends are then gradually drawn together, as the net is being drawn on shore.

Model No. 17.
Sinhalese, Barudel paruwa.
Tamil, Perumwaralpathei.

A flat-bottomed boat, plied with oars and poles. Is named from the net "Barudel" which it carries. This net is 400 yards in length and 12 yards in depth, and is similar to the Mādel, but on a smaller scale.

# HELIGOLAND.

ing industry of Heligoland is carried on by a fleet of open boats which f:—

| scription. | No. | Length. | Beam. | Depth. | Draft of Water. | Value. | Remarks. |
|---|---|---|---|---|---|---|---|
| | | feet. | feet. | feet. | feet. | £ | |
| s .. .. .. | 31 | 31 | 9 | 5 | 2·3 | 250 | Model in Exhibition. |
| ler Boats .. | 18 | 28 | 7 | 3 | 1½ | 125 | |
| le Boats .. | 21 | 24 | 6 | 2½ | 1½ | 90 | |
| ter Boats .. | 114 | 18 | 5 | 2 | 1 | 27 | |

ese boats are built entirely of oak, and are flat-bottomed, to enable them ached, and are sailed with lee boards.

-The sloops are rigged with sprit sail and fore sail, with two jibs; as ry no bowsprit, a spar is used temporarily for setting the jib, and when free this spar is rigged out on the beam with the jib set on it. They all ght days' provisions and water, two anchors, a hemp cable, and from 7 to f stone ballast. In case of the weather being too bad for them to get ey anchor, take the mast down, and thus ride out the heaviest gale, one stantly baling. The other boats are all rigged with standing lug.

—The fish is caught entirely by line; every sloop carries from 15 to 22 ch of 40 fathoms with 40 hooks. The lines are shot across the stream; line is secured to an anchor, which is buoyed; the boat then stands eering the lines as she goes, each line being bent to the next, and each ing a small anchor to take it to the bottom, and keep it there. When of the last line is nearly out, the boat anchors, and after a time weighs ks towards the buoy, hauling the lines in as she goes. The bait is usually s, which are principally got on "Sandy Island," three-quarters of a mile main island of Heligoland.

rly the fishing fleet consisted of nearly a *hundred* sloops, but by constant rough gales it has dwindled down to the present number, of which but ow fit for sea.

s.—There are two fishing seasons, from March to the end of June, and tober to about January, i.e. when the weather necessitates the hauling up ats. The fish caught is almost entirely haddock, with a few cod and an al turbot.

r.—In the winter the fishing is carried on in company. The fish is to the island and delivered to an agent, who has it cleaned and packed, warded by steamers, which are sent over on receipt of telegrams by the

contractor on the continent. This autumn fishing for the last five years has yielded an average of 171,000. The highest year was 1880, with 368,700 haddock and 1,266 cod; the lowest 1881, with 58,300 haddock and 154 cod, calculated at *seven* score the hundred, the average price paid by the contractor during the above period being £1 3*s.* per hundred (140) haddock and cod 1*s.* each.

*Spring Fishing.*—In spring the boats generally take their own fish to such markets on the opposite coasts, often from the fishing grounds themselves; it is therefore very difficult to arrive at a correct calculation of the season's catch, as well as to estimate the total sum realized, no data having been kept. Prices, however, I find vary from 15*s.* to £3 10*s.* per seven score.

*Summer.*—In summer there is little or no fishing carried on beyond what is needed to supply the wants of the restaurants, &c., most of the fishermen being employed in the ferry which takes the visitors over to bathe at Sandy Island, and in boating along with the guests.

*Lobsters.*—From 20,000 to 30,000 lobsters are collected annually on our rocks, the close season being from the 13th June to the 13th September. These are stored in lobster boxes, containing often as many as 200 each, the fish being either for local use, or are sent to the Continent, where Heligoland lobsters are greatly prized. It is estimated that to obtain these results 4000 lobster pots (model to be seen with sloop) are in use, value about 4*s.* each. The heavy gales to which we are so subject do great injury to these pots, so that the occupation is not so remunerative as it would seem. The average price realized for lobsters per lb. is from 7½*d.* to 1*s.* 6*d.*

*Oysters.*—The Heligoland Oyster Bank is let to a contractor; it is fished from September to March by the sloops, aided by rudder boats, on a bank about three miles to the eastward of the island, dredges being used. It has yielded let 130,000 of late years, mainly owing to disagreements between the contractor and the fishermen. The price paid is 7 marks per thousand delivered to the contractor's agent in the island.

*Fishing grounds.*—The Haddock fishing grounds are from the N. through W. to S.E. of the island at from eight to forty miles from it.

The Lobsters are caught on the reefs that extend N.S. and W. of the Main and Sandy Island to a distance of about four miles.

*Use of fish.*—The Heligolanders live almost entirely on fish, a meat meal being of rare occurrence. Fish is not used as manure, neither is it cured for export or for sale.

*Fishermen.*—By last census there were 307 returned as fishermen; the entire population, however, could be almost included (out of the bathing season) in this category, as old men and children aid in preparing lines, &c., which are cleaned, carried, and baited by the women.

*Colonial Aid.*—No special action in aid of fishermen, on the part of the Colonial Government, is possible in the present impoverished state of its finances.

*Benefit Societies.*—When our fleet was nearly destroyed in 1878 a subscription was started in Germany in aid of the fishermen, which realized £1535; from this loans without interest were given to the sufferers. The balance with the interests thereon and the repayments as above amounts now to £840, which sum is allowed to accumulate till it reaches £1000, when it is to form the capital of an assurance fund or benefit society started at the same time to aid in repairing future disasters; to it the fishermen contribute:—

Autumn fishing: for each 100 (7 score) of fish 1 M.=1 shilling; 100 oysters 5 Pfennig, about ¾*d.*

Spring fishing: each sloop, 15 shillings; each rudder boat, 12 shillings; each middle boat, 8 shillings; each lobster boat, 4 shillings.

The amount subscribed up to date is £460 10*s.*; the amount spent in particular aid, £452 10*s.*; in hand, £8.

Should the society dissolve, then the money is to be divided among the subscribers, with the exception of the capital of £1000, which is to remain for ever at interest for the benefit of old fishermen and their widows.

*Final Remarks.*—Though the waters of the North Sea abound in fish, and often fleets of hundreds of English, German and Dutch smacks are in sight of the island, the Heligolanders, though yielding to none as fishermen, cannot participate in the riches which God has brought to their door, for without a harbour they can but use vessels such as can be hauled up in bad weather, and therefore such as preclude them from going far to sea to earn their daily bread.

T. O'Brien, Lieut.-Col.
*Governor.*

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## LIST OF EXHIBITORS.

### Division I.

**Gear of every description and of all nations used in trawl, herring, long line, hand line, and every other mode or system of fishing, including all nets, lines, hooks, harpoons, tackle, &c., employed in the same.**

**LÜHRS, HILMER,** Heligoland.
Fishing line in tray, complete.

### Division II.

**Oyster dredges, crab, lobster, prawn, &c. pots, and other appliances for catching fish of this description.**

**LÜHRS, HILMER,** Heligoland.
Lobster Pot.
Model of a Lobster Box.

---

ANDERSON, ABBOTT, & ANDERSON'S
PORTABLE INDIA-RUBBER BATHS
Fold into very small compass.
37, QUEEN VICTORIA STREET, LONDON, E.C.

## Division IV.

**Fishing craft of all nations: models and representations of the same.**

ii. Fishing vessels and boats other than steam vessels.

**JASPERS, PAUL A.**, Boatbuilders, Heligoland.
Model of a Heligoland Fishing Sloop with all necessaries for fishing.

## Division V.

**Ropes and canvas suitable to fishing vessels.**

**GAETHES, H.**, Heligoland.
Buoy, invented by the Exhibitor.

# FOREIGN.

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# AMERICA, UNITED STATES OF.*

## The Fisheries of the United States.

1880, according to the returns of the Census Bureau, the number of persons loyed in the fishery industries of the United States was 131,426, of whom 684 were fishermen, and the remainder shoresmen. The fishing fleet con- d of 6,605 vessels (with a tonnage of 208,297·82) and 44,804 boats, and the amount of capital invested was $37,955,349, distributed as follows:— els, $9,357,282; boats, $2,465,393; minor apparatus and outfits, $8,145,261; r capital, including shore property, $17,987,413.

he value of the fisheries of the sea, the great rivers and the great lakes, was ed at $43,046,053, and that of those in minor inland waters, at $1,500,000— l $44,546,053. These values were estimated upon the basis of the prices of products received by the producers, and if average wholesale prices had been idered the value would have been much greater. In 1882 the yield of the ries was much greater than in 1880, and prices both "at first hand" and at lesale were higher, so that a fair estimate at wholesale market rates would e their value at the present time rather above than below the sum of ,000,000.

nce 1865 the fisheries have increased in extent and value to a degree without llel in their previous history. Before the war of the rebellion (1861–1865) y of the fisheries which are now most important had no existence, and for or five decades preceding only the oyster fishery, whale fishery, cod fisheries, kerel fishery, and shad and alewife fisheries were of any considerable ortance. The recent increase is chiefly due (1) to the introduction of the roved methods of refrigeration, by means of which sea-fish are distributed ely throughout the interior of the country; (2) to greatly extended facilities steam transportation; (3) to the extended introduction of methods of packing hermetically-sealed cans, and of more attractive methods of preparing for ket the several kinds of dried and smoked fish; (4) to the introduction of roved vessels and apparatus by means of which the expense of capture has n greatly diminished; and (5) to the efforts of a considerable number of husiasts, anglers, statesmen, and philanthropists, who, by the organisation of hery Societies, State Fish Commissions, and the United States' Fish Commis- , and by their publications, have awakened public interest, secured extensive ropriations of public money for the propagation and acclimatisation of useful es, and have demonstrated the value to the country of many previously lected fishery resources.

The fisheries of the New England States are the most important. They ge 37,043 men, 2,066 vessels, 14,787 boats, and yield products to the value

* A number of special catalogues are being printed to accompany this collection. These may tained at the office of the American Commissioner.

of $14,270,393. In this district the principal fishing ports in order of importance are: Gloucester, Portland, Boston, Provincetown, and New Bedford, the latter being the centre of the whale fishery. New England was settled in 1620 by colonists, chiefly from the western counties of England, who selected that portion of the coast on account of its peculiar fitness for the prosecution of the fisheries, and by the middle of the seventeenth century there was a considerable fleet of ketches and snows engaged in the cod fishery on the off-shore banks, where, especially on the banks of Newfoundland, France, Spain, Portugal, and England, already had a fleet of several hundred large vessels. Just before the war of the revolution New England had 665 vessels and 4,405 men employed in its fisheries.

Next to New England in importance are the South Atlantic States, employing 52,418 men, 3,014 vessels (the majority of which are small, and engaged in the shore and bay fisheries), 13,331 boats, and returning products to the value of $9,602,737.

Next are the Middle States, employing in the coast fisheries 14,981 men, 1,210 vessels, 8,293 boats, with products to the amount of $8,676,579.

Next are the Pacific States and Territories with 16,803 men, 56 vessels, 3,567 boats, and products to the amount of $7,484,750. The fisheries of the Great Lakes employ 5,050 men, 62 vessels, and 1,594 boats, with products to the amount of $1,784,050. The Gulf States employ 5,131 men, 197 vessels, and 1,252 boats, yielding products to the value of $545,584.

Forty-three distinct fisheries are recognised by American writers, each being carried on in a special locality, and with methods peculiar to itself. Among the most important of these are the oyster fishery, the off-shore cod fishery, the whale fishery, the fur-seal fishery, the mackerel fishery, the menhaden fishery, the halibut fishery, the Antarctic seal and sea-elephant fishery, the west-coast salmon fishery, the lobster, the shad and alewife fishery, the swordfish fishery, and the clam fisheries.

The off-shore fisheries are carried on chiefly by citizens of the New England and Middle States, and are prosecuted on the great oceanic banks extending from Nantucket to Labrador, and upon the ledges and shoals between these and the coast.

The great Purse-seine fisheries for mackerel and menhaden are carried on north of Cape Hatteras at distances from the shore varying from one mile to one hundred and fifty miles. The fishing grounds in the Gulf of St. Lawrence, formerly frequented by many hundreds of American vessels, have been entirely abandoned since the introduction of the Purse-seine, and in 1882 only one vessel visited those waters, returning with about 200 barrels of mackerel. The oyster fishery is located for the most part between Cape Hatteras and Cape Cod, chiefly in the great inland bays. In all the great rivers of the Atlantic coast are fisheries for the anadromous shad and the two species of alewife. About the Keys of southern Florida is an extensive sponge fishery, and on the shoals of the Gulf of Mexico the red snapper and grouper fisheries are yearly increasing in value. The fur-seal fishery is chiefly located upon the Pribylov Islands of Alaska. A small fleet of vessels yearly penetrates to the ice-bound islands of the Antarctic for seal-skins and sea-elephant oil. The whaling fleet, with head-quarters at New Bedford and San Francisco, in the main frequent the North Pacific, though a number of smaller vessels, many of them from Provincetown, pursue the sperm whale in tropical waters. The salmon fishery is seated chiefly upon the Columbia River and its tributaries, though other rivers in Oregon and California produce large

of salmon, which is extensively "canned" and exported. The most
roduct of the Great-lake fisheries is the whitefish. The swordfish
Southern New England, though employing but 40 vessels, and perhaps
roduces 1,500,000 pounds' weight annually.
ort of American fishery products is comparatively small owing to the
ie demand for such products for home consumption is really greater
upply, and is constantly on the increase. In 1880 the total value of
ah products amounted to $5,744,580; of which, according to custom-
rds, England received $2,601,017. Of the quantity sent to England
was in canned preparations, and $363,790 in fresh oysters, the
being chiefly products of the whale fishery. In former years there
ensive export trade in dried cod with Spain and Portugal, but this is
ly abandoned. Large quantities of canned salmon are sent to China,
l Australia.
ent no subsidies are allowed to fishermen, except that the duties on
alt, used in the preparation of fish, are remitted; this practice was
863, at which time the old bounty law was repealed.
ited States, with the intention of aiding its fishermen, has paid to
ain the sum of $5,500,000 for the privilege of fishing in the British
Waters from 1873 to 1885.
71 the United States has appropriated over one million dollars to be
e United States' Fish Commission in behalf of the fishermen and fish
, and under the direction of the Commissioner, Prof. Spencer F. Baird,
tant results have been accomplished. All the state governments with
ion of six have established state fish commissions, and most of them
liberally supported by grants of money.
leveloped fishery resources are very great. Many of the fishes and
es which in Europe are highly valued by the poorer classes are never
Only about 150 of the 1500 species of fishes known to inhabit the
he United States are ordinarily found in the markets.
orate report upon the fishes and fisheries of the country in 1880 is now
ished by the Government—the joint production of the Fish Commission
enth Census.

G. Brown Goode,
*Assistant Director of the U. S. National Museum, Washington, and Commissioner to the Exhibition.*

-The participation of the United States in the Exhibition is in
with an Act of Congress approved July 18, 1882, by the terms of
United States Commissioner of Fisheries was instructed to prepare, under
s of the Department of State, a complete and systematic representative
of the fisheries of the United States.]

## COLLECTIVE EXHIBIT OF THE UNITED STATES.*

### ANALYSIS.

A.—Aquatic Animals and Plants beneficial or injurious to Man.
B.—Fishing Grounds and Geographical Distribution.
C.—Apparatus of Sea and Freshwater Fishing.
D.—Fishing Vessels and Boats and their Fittings.
E.—Fishermen and Anglers: Dress, Economic condition, &c.
F.—Apparatus connected with the Whaling and Sealing industry.
G.—Fishery Products and the apparatus and methods of their Preparation.
H.—Fish Culture: apparatus and methods.
I.—Investigation of the Waters: Deep Sea Research, &c.
K.—Literature of Fish, Fishing, and Fisheries.

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### SECTION A.—AQUATIC ANIMALS AND PLANTS OF NORTH AMERICA BENEFICIAL OR INJURIOUS TO MAN.

#### I.—MAMMALS.

1. Group of Fur Seals, *Callorhinus ursinus*, with screen of water-colour sketches by Henry W. Elliott, illustrating the seal life of the Pribylov Islands; stuffed Ribbon Seal, *Histriophoca equestris*; cast of Harbor Seal: stuffed head of walrus. *Odobænus obesus*.
2. Cast of Manatee, skull of *Rhytina gigas*, from Bering Island.
3. Cast of White Whale, *Delphinapterus*; fœtal Blackfish, *Globicephalus*; Casts of several smaller-toothed cetaceans, with skulls of the same; casts of heads of cetaceans.
4. Polar Bear, *Ursus maritimus*, from Wrangel Land.

#### II.—BIRDS.

5. Collection of skins of Aquatic Birds of the United States Exhibited by the United States National Museum.
6. Groups of Aquatic Birds.

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* The collections here enumerated are for the most part the property of the U. S. National Museum and the U. S. Fish Commission.

ANDERSON, ABBOTT, & ANDERSON'S
IMPROVED FISHING BAGS.
STRONG AND WELL MADE.
37, Queen Victoria St., London, E.C.

### III. IV.—Reptiles and Batrachians.

of Alligator, *Alligator mississippiensis.*
s of Tortoises, *Gopher*, *Xerobates polyphemus*, Terrapin, *Malaco-clemmys palustris*, Slider, *Pseudemys rugosa*, Southern Terrapin, *Macrochelys lacertina*, Soft-shell Turtle, *Aspidonectes ferox*, Green Turtle, *Chelonia mydas*, Loggerhead Turtle, *Thalassochelys caonana*, Leatherback Turtle, *Sphargis coriacea.*
s of Water Snakes, *Tropidonotus*, several species, Moccasin, *Ancistrodon piscivorus*, Rattlesnake, *Crotalus adamanteus*, &c.
ction of 24 species of tailed batrachians, including *Siren*, *Necturus*, *Amphiuma*, *Menopoma*, *Amblystoma*, *Siredon*, &c.
species of edible frogs, including Giant Bullfrog, *Rana Catesbiana.*
: of living tortoises; tank of living water snakes.

### V.—Fishes.

s of 121 characteristic fishes, including most of the important economic species, arranged on nine screens.

s of Giant Catfish, *Amiurus ponderosus*, Guasa, *Serranus guasa*, &c.
ries of photographs of the important fishes of the United States.
ries of proofs of engravings of the food fishes of the United States, prepared to accompany the forthcoming quarto report, with specimens of the original drawings.
ar sketches of fishes; chromolithographs of twenty water-colour sketches of game fishes exhibited by Charles Scribner's Sons (publishers of Kilbourne & Goode's Game Fishes of the United States).
s of fishes in alcohol:
Fishes of Alaska.
The American Salmonidæ.
Fishes of the Gulf of Mexico and East Florida.
The genera of fresh-water species.
Fishes of the Adirondacks, collected by Fred. Mather.
ng fish eggs, fishes, &c. All under fish culture; section **F**.
ction of market fishes in fresh condition on ice sent from time to time by E. G. Blackford, New York.

### VI.—Mollusks.

als of Giant Squid, *Architeuthis princeps* and of Giant *Octopus*, prepared under direction of J. H. Emerton.

DERSON, ABBOTT, & ANDERSON
Are the Largest Manufacturers of
ATERPROOF GARMENTS
IN THE WORLD.
UEEN VICTORIA ST., LONDON, E.C. WORKS: LIMEHOUSE, E.

22. Series of Gasteropoda, useful as affording food, bait, &c., or injurious by destroying edible mollusks.
23. Series of specimens showing the life of the American Oyster from the time of attachment to full growth, under various conditions influencing development.
24. Collection of plates and diagrams illustrating the embryology of the American Oyster.
25. Series of American Oysters, illustrating geographical distribution and local variation.
26. Other useful Mollusks, *Unio*, *Haliotis*, &c.
27. Specimen illustrating injurious work of Teredo and other pernicious Mollusks.
28. Enemies of the Oyster.

VII.—MARINE AND FRESH-WATER INVERTEBRATES, EXCLUSIVE OF MOLLUSCA.

29. Collection of economic Crustaceans, mainly alcoholic, containing forty-eight species, used as food and bait, and injurious to submarine structures of wood. It includes the Lobster, *Homarus americanus*, Rock-lobster, or Salt-water Crayfish, *Panulirus interruptus*, River Crayfish, *Cambarus* and *Astacus*, common edible Crab, *Callinectes hastatus*, Rock Crabs, *Cancer irroratus* and *Borealis*, California Market Crab, *Cancer magistra*, Stone Crab, *Menippe mercenaria*, common Shrimp, *Crangon vulgaris*, Southern Shrimp, *Penæus setiferus*, California Shrimp, *Crangon franciscorum*, King Crab, *Limulus polyphemus*, &c.
30. Collection of economic worms in alcohol, including the marine annelids most commonly used as bait, and the American medicinal leech, *Macrobdella decora*, Verrill.
31. Collection of economic echinoderms, mostly in alcohol, containing five species, used as food, or available as such, injurious to oyster beds, &c., as follows: Sea cucumber, *Pentacta frondosa*, Sea Urchins, *Strongylocentrotus dröbachiensis*, *S. franciscorum*, *Echinarachnius parma*, Starfishes, *Asterias vulgaris*, *a.* Forbesii.
32. Collection of Florida commercial sponges, containing six species and two hundred and thirty-seven specimens, furnished by McKesson and Robbins, of New York. The species are as follows: Glove Sponge, *Spongia graminea*, Sheepswood Sponge, *S. gossipina*, Velvet Sponge, *S. meandriniformis*, Grass Sponge, *S. cerebriformis*, Yellow Sponge, *S. corlosia* and *dura*. From the same source, four specimens of Sheepswood Sponge, illus-

ANDERSON, ABBOTT, & ANDERSON'S
FISHING STOCKINGS AND BROGUES
VERY LIGHT.] ALL IN ONE. [VERY STRONG.
37, Queen Victoria Street, London, E.C.

trating artificial propagation by means of cuttings; also, one specimen of the boring sponge, *Cliona sulphurea.*

mplete collection of the described species of fresh-water Cray-fish, *Cambarus* and *Astacus*, occurring within the limits of the United States. Contains over forty species.

### VIII.—Algæ.

llection of marine Algæ of the United States, prepared by W. G. Farlow.

ates of Wood's "Fresh-water Algæ of the United States," as published by the Smithsonian Institution.

## Section B.—FISHING GROUNDS.

### IX.—Models and Maps of Fishing Grounds.

rdboard model in relief of the off-shore banks of North America, from the Grand Bank to New Jersey, showing contours to a depth of 2,800 fathoms.

lief model of the Gulf of Maine, prepared by C. Lindenkohl.

lief models of the Eastern Continental Slope, prepared by the United States Coast and Geodetic Survey.

odel of a Chesapeake Oyster-bed, showing effects of dredging and undredged portions, prepared by Lieut. Francis Winslow, U.S.N.

hart showing the location and extent of the present and abandoned whaling grounds of the world, prepared by A. Howard Clark

ries of charts showing the location of the Oyster-beds and the present condition and progress of Oyster culture, prepared by Lieut. Francis Winslow, U. S. N.

harts showing the location of the principal fishing-grounds.

eneral coast charts, exhibited by the United States Coast Survey, United States Navy Hydrographic Office, and S. Thaxter and Sons.

### X.—Maps showing Geographical Distribution.

harts showing distribution of the pinnipeds of the world, prepared by J. A. Allen.

hart showing geographical distribution of the seals and fur-bearing animals of Alaska, prepared by W. H. Dall.

eries of eight charts, showing distribution of food and game fishes of North America, prepared by G. Brown Goode.

THE ROYAL

FISHING & YACHTING BOOTS FOR LADIES,

*AS MADE EXPRESSLY FOR HER MAJESTY THE QUEEN.*

ANDERSON, ABBOTT, & ANDERSON, 37, Queen Victoria Street, E.C.

## SECTION C.—APPARATUS OF SEA AND FRESH-WATER FISHING.

### XI.—CLUBS, SPEARS, DARTS, RAKES, AND DREDGES.

47. Bows and arrows, darts, throwing sticks, spears, harpoons, clubs, spear rests, &c., made and used by the Indians and Eskimos of Alaska, the North-west coast, and other parts of the United States.
48. Eel spears, porpoise and dolphin grains, swordfish lily-irons and lances, and harpoons used along the Atlantic seaboard for the capture of numerous species; halibut killer and gob-stick for killing the fish and disgorging the hook; squid jigs used by Grand Bank Cod fishermen in the capture of squid for bait: mackerel gaff or gambeering iron and mackerel bob formerly used by New England fishermen for the capture of mackerel without the use of bait.
49. Oulachan rake, used by the Indians of the North-west coast; clam-rakes, hoes, and claws, sponge-hook, moss-rakes, oyster-tongs, rakes, and scrapers.

### XII.—FISH-HOOKS, JIGS AND DRAILS, ARTIFICIAL BAITS, FLIES AND FLY-HOOKS, GULLETERS, CLEARING RINGS, &c.

50. Series of Indian and Eskimo hooks made of bone, wood, and iron.
51. Series of steel hooks, showing the manufacture of hooks from the plain wire to the finished hook, and all the principal varieties of fish-hooks used in sea and fresh-water fishing, including the Barbless, Limerick, Central-Draught, Kirby, Aberdeen, Kinsey, Carlisle, shark and dog-fish hooks.
52. Jigs and drails for the capture of cod, weakfish, Spanish mackerel, bass, bluefish, and dolphin; mackerel jigs formerly extensively used, with lead, ladles, molds, file, rasp, &c., used in their manufacture.
53. Spoon-baits, trolling-spoons, spinners, minnows, and insects for salmon, trout, bass, pike, and pickerel fishing.
54. Case of lure-baits and ornamented hooks from Alaska.
55. Collection of over seven hundred varieties of salmon, bass, and trout flies, arranged on cards and labelled with their trade names.
56. Case of insects used for bait and injurious or useful to the fisheries, prepared by Prof. C. V. Riley.

ANDERSON, ABBOTT, & ANDERSON'S
PORTABLE INDIA-RUBBER BOATS
For Fishing, Shooting, Exploring, and Pleasure Purposes.
37 QUEEN VICTORIA ST., LONDON, E.C. Works: LIMEHOUSE, E

Spring hooks for pickerel, "snap and catch'em hooks," Edgar barbless hooks, eagle-claw trap.

Bait-boxes, creels, gulleters, clearing rings, pocket scales, and other miscellaneous articles used by anglers.

### XIII.—Fishing Lines and Rigged Gear.

Indian and Eskimo lines made of kelp, whale and seal hide and cedar wood.

Cotton lines, shroud-laid and cable-laid, white and tarred; linen, flax, grass, and silk lines, including waterproof fly-lines, and other silk lines for salmon and trout fishing.

Spanish gut as imported for the manufacture of leaders; single, double, and twisted gut leaders, minnow gangs, brails, gangings, used in various sea fisheries.

Stone, lead, brass, and composition sinkers for nets, seines, and hand lines.

Indian and Eskimo floats carved in wood; glass, cork, and wood floats for nets and lines in sea fisheries; wood, cork and quill floats for pond fishing.

Hand-lines rigged for cod fishing on the off-shore and in-shore banks and ledges; pollock hand-lines; bluefish trolling-lines; lines for pond fishing; gear for the capture of catfish, weakfish and other species; Indian trawl lines made of cedar; cod, haddock, and halibut trawls in sections and fully rigged with buoys and anchors; snares and eel bobs; Indian fishing lines from Alaska and the Northwest coast.

### XIV.—Fishing Rods, and Reels for Lines and Nets.

Plain and split bamboo rods, for salmon, trout, bass, and general fishing; ash and hornbeam, and ash and lancewood rods; combination trolling pole, harpoon-line holder and cane; and other kinds of rods.

Simple reels for fly-fishing, with and without check, made of brass, German silver, rubber, ebonite, and celluloid. Multiplying reels for bass-fishing, with and without check; automatic reels, Kentucky reel, quadruple, multiplying, nickle-plated reel. Spools, winders, trawl-line rollers, line chocks for whale boats, trawl-winch or hurdy-gurdy, &c.

ANDERSON, ABBOTT, & ANDERSON'S
FISHING BROGUES
Are Unsurpassed.
7, Queen Victoria Street, London, E.C.

## XV.—Nets and Seines and Materials used in their Manufacture.

67. Twine used in making nets and seines, exhibited by American Net and Twine Company. Samples of netting, white, tanned, and tarred, showing varieties of mesh and kinds of twine.
68. Gill nets, full-sized and in models, for the capture of shad, cod, mackerel, herring, white-fish, minnows, and other species. Gill nets made by the Indians from animal fibre, "babiche," &c.
69. Trammel nets used for general fishing in rivers and ponds of Northern Mississippi Valley. Herring and cod seines. Baird collecting seine and "Baird net." Seines and nets made of grass, pineapple fibres, and other materials.
70. Handle or dip nets and landing nets used in the capture or in handling of mackerel, menhaden, trout and other fish. Net used in the capture of the oulachan and surf smelt by the Indians of the Northwest coast. Dip nets or baskets used by the Indians.
71. Oyster dredge and hoisting apparatus, dredge nets, dredges for clams and other shell-fish. Full-sized oyster dredge used by dredging steamers.
72. Folding or jerk nets, including full size and model mackerel purse seines and model mackerel-seine pocket, mullet and shrimp cast-nets, &c. Model of mackerel purse-seine mounted on iron pipe to show the manner of pursing, &c.

## XVI.—Fish Traps, Weirs, and Pounds.

73. Models and drawings of fish slides used for catching shad in the rivers of North Carolina.
74. Models of bar weirs and brush weirs used for catching herring in the Bay of Fundy; salmon weirs, heart-nets, pound nets, floating traps, basket weirs from Alaska, &c. Model of fish weir used by aborigines of Virginia in the fifteenth century.
75. Wicker fish-pots used by Indians of California, and by fishermen of Florida. Lobster pots in full size, and models showing the various styles used on the coast of New England.
76. Eel pots, with and without leaders, full size, and model fyke nets, bass trap, &c.

COPY OF TESTIMONIAL GIVEN RESPECTING

**ANDERSON, ABBOTT, & ANDERSON'S**

REGULATION ARMY WATERPROOF CLOAK.

Head Quarters, R.V.C., Berwick-upon-Tweed, May 28, 1877.

Gentlemen,—I have sent the Regulation Cloak that I purchased from you some five or six years ago. Will you have the goodness to put a new collar on it, and return to me.

In justice to yourselves I ought to mention that the cloak in question has seen a good deal of rough work, and with the exception of the collar is not very much the worse.—Yours obediently,

(Signed) Robert Weddell, Captain, 1st B., R.V.C.

Messrs. Anderson, Abbott, and Anderson, *Queen Victoria Street, London, E.C.*

### XVII.—Fishing Stations.

Model of shad battery at Havre de Grace, Maryland, and model of "pond fishery" for white-fish at Grassy Bay, Detroit River, Michigan.

### XVIII.—Knives, Gaffs, and other Apparatus.

Indian and Eskimo knives made of stone, bone, and iron for cutting fish and blubber.

Cod splitting, ripping, and throating knives; finning and flitching knives; bait chopping knives; mackerel splitting and reaming or creasing knives; scaling knives, slivering knives, &c.

Salmon, cod, haddock, halibut, and mackerel gaffs; halibut cutters; hook used in decapitating the fish; fish forks and pews used in storing and handling the catch.

Bait mill for grinding fish for mackerel bait; clam-choppers, &c.

### XIX.—Illustrations of the Fisheries.

Series of sketches in crayon illustrating the various sea fisheries.

Series of photographs large and small illustrating the methods employed in the hand-line and trawl-line, cod and halibut fisheries, the lobster and other fisheries.

## Section D.—FISHING VESSELS, BOATS, AND FITTINGS.

### XX.—Vessels and Boats.

Series of rigged models of all types of vessels used in the fisheries past and present.

Series of builders' models showing evolution of the New England fishing schooner.

Series of models of all important types of boats used in the fisheries; also full-size whale boat, dories, shadow canoe, portable and folding boats, Eskimo bidarka and bidarra, Indian birch canoe, &c.

Series of large photographs, 30 by 40 inches, showing fishing boats and vessels in different situations.

Series of large photographs of ship yards and boat shops illustrating the construction of fishing craft.

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FISHING STOCKINGS
ARE GUARANTEED ABSOLUTELY WATERPROOF.
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### XXI.—Boat Fittings and Appliances.

89. Canvas used on fishing vessels, exhibited by Russell Mills Company, Old Colony Mills, and others.
90. Cordage used by fishing vessels, exhibited by Sewall, Day & Co., and others.
91. Model of steam windlass, exhibited by American Ship Windlass Company; models of capstans exhibited by Frederick S. Allen.
92. Collection of nautical instruments and books, such as are used on the New England fishing vessels.
93. Series of cabin lamps, lanterns, torches, &c., used on vessels and boats and in angling.
94. Fog horns of various types, including Collins' patent fog alarm.
95. Copper paint for vessels; Nelson's canvas-preserving solution.
96. Large number of special appliances for rigging vessels and boats, exhibited by Wilcox, Crittenden & Co., and others; chafing gear, hanks, grommets, clews, thimbles, row-locks, rudder fixtures, &c.
97. Collins' adjustable marine drag, and Collins' improved adjustable marine drag.
98. Collection of oars and paddles, exhibited by E. W. Page and others.
99. Charts of United States Coast Survey, United States Hydrographic Office, S. Thaxter & Son, and others.

## Section E.—FISHERMEN AND ANGLERS.

### XXII.—Fishermen and their Apparel.

100. Lay figures of fishermen of different classes, showing costumes, implements, &c.
101. Photographs, 30 by 40 inches, showing groups of fishermen of different nationalities, or as engaged in the several branches of the fisheries.
102. A collection of fishermen's wearing apparel, in woollen, oiled cotton and rubber; boots, mittens, &c.
103. A collection of anglers' wearing apparel.

### XXIII.—Food, Medicine, Shelter.

104. Canned, steam-dried, and other foods used by fishermen and anglers.
105. Fisherman's medicine chest, such as is carried by the Gloucester schooners.

These articles are very easy, light, and portable, and invaluable to Invalids and Travellers.

AIRPROOF BEDS, PILLOWS, AND CUSHIONS.

WORKS: LIMEHOUSE, E.
37, Queen Victoria St., London, E.C.
ANDERSON, ABBOTT, AND ANDERSON.

Series of photographs of fishermen's houses, boarding-houses, bethels, &c.

Tent and portable house for anglers, with complete camping outfit.

### XXIV.—Vessels' Papers.

Vessels' papers, insurance policies, log-books of fishing voyages; papers of Gloucester Seamen's and Fishermen's Widows' and Orphans' Aid Society.

### XXV.—Habits of Fishermen.

Collection illustrating the games, amusements, literature, art-work of the fishermen; musical instruments, carvings ("scrimshandy"), &c.

### XXVI.—Fishermen's Tools and Outfits.

Fishermen's tools, "ditty-boxes," palms, sail-needles, knives, netting-needles and mesh-boards, coopering tools, &c.

## Section F.—APPARATUS CONNECTED WITH THE WHALING AND SEALING INDUSTRY.*

### XXVII.—Whaling Vessels and Boats.

Model of a four-boat whale ship, with a decapitated sperm whale alongside, illustrating the manner in which the blubber is cut off, hoisted in, and lowered into the blubber room; also showing the amount of canvas carried by a vessel while engaged in this work, and the duties of the officers and foremast hands, as well as the positions of the try-works and whale boats.

Model of "camels," built in 1842, for floating whaling vessels over Nantucket Bar, with the hull of a vessel showing the relative positions of the one to the other when in operation.

Model of try-works transported by whaling vessels, for extracting the oil from the blubber, with the receptacles for scrap and for cooling the oil; also, miniature models of some of the implements commonly known as "try-works gear" for manipulating the oil and scrap.

* Here are included, for convenience of arrangement, the apparatus of manufacture or preparation of whaling products, the preliminary stages of which being usually conducted on board of the whaling vessels may be regarded as a portion of the fishery proper.

Elastic Stockings, Knee Caps, &c., give great support in cases of Weakness, Varicose Veins, and Sprains.

ANDERSON, ABBOTT, and ANDERSON'S

Ice Bags, for the Head and Spine.

Waterproof Bed Sheeting, Travelling Conveniences, Syringes, Accouchement Sheets, Belts, and Braces.

114. A full-sized whale boat, 28 feet long, with all the apparatus of capture; the names of the various parts of the boat, the boat fittings, and each article used in the chase and capture of the whale are plainly labelled. Every article in the boat, as well as the boat itself, have been in actual use.

## XXVIII.—Whaling Craft, Harpoons, Guns, and Lances.

115. A series of 47 hand-harpoons, arranged in groups, but not in chronological order, including the forms employed by the early and modern whalemen, and several types of the walrus-harpoon.

116. A series of guns, including eight shoulder guns of different patterns, both breech-loading and muzzle-loading; several types of the darting gun; swivel gun; and rocket gun; also accessories, including cartridges, wads, &c.

117. A series of 33 gun harpoons of various forms. Though these irons have no commercial value at present, with the exception perhaps of those intended for the swivel-gun, yet they have been used, and are interesting and valuable as a whole, constituting as they do the numerous links in the chain that connects the past with the present.

118. Earliest types of the hand-lances, formerly exclusively used for killing Whales, the past and present forms of the lances for killing Seal, Sea-elephant, and Walrus, the old-fashioned, non-explosive gun-lance, and the bomb-lance, darting-bomb, and rocket-bomb of the present. Also an example of the first bomb-lance, patented in the United States for killing Whales. Two forms of the explosive harpoons, which may be thrust by hand, and one form intended to be used in connection with an improved pivot gun. An explosive hand-lance, several bomb-lances that have been cut from dead Whales, some of which failed to explode, others being exploded and represented by fragmentary pieces.

## XXIX.—Cutting Gear.

119. A series of whalers' implements known comprehensively as cutting-gear and try-works gear, arranged on and about a pyramidal wooded frame-work, from the centre of which the blubber-tackle is suspended. A cutting stage is rigged at the right; upon it is placed a lay figure, life-size, representing an officer in the act

ANDERSON, ABBOTT, AND ANDERSON,
ARE THE MANUFACTURERS OF THE
ARMY REGULATION CLOAK,
37, Queen Victoria St., London, E.C. Works: Limehouse, E.
Horse Guards, 10th *March*, 1871.—Gentlemen,—The Waterproof Coat made by you has been approved of as a pattern for Coats to be worn in wet weather by all Officers. The Material seems excellent, and is exactly what was recommended by the Committee. Your pattern has been now sealed and deposited at the Horse Guards.—I am, Gentlemen, yours obediently,
ARTHUR HERBERT, A.A.G., Qd.
*N.B.*—A General Order on the subject will be issued in next month's orders.

of cutting the blubber from the whale. Two long slabs of baleen cross each other near the top in the central front, and boat waifs are placed at the right and left corners. Various long-handled implements, including the cutting spades, head-spades, skimmers, and bailers, are arranged in frames at the rear. The heavy chains and toggles used for fastening the whale to the vessel, and for hoisting in the blubber, are placed above the front base. The superstructure consists of a main royal pole, lookout bows, an American ensign, and a life cast of a petty officer standing upon the cross-trees, with a marine glass at his eye, on the lookout for whales.

### XXX.—Aboriginal Whaling and Sealing Apparatus.

A series of whaling implements used by the Makah Indians of Cape Flattery, Washington Territory, including the harpoon-staff, harpoon, and lanyards, the lance-pole and lances, the sealskin buoys, and tow-ropes made of the fibres of spruce roots.

Harpoons and lances employed in whaling and sealing by the Eskimos of Alaska, and the Hudson Bay region.

## Section G.—FISHERY PRODUCTS AND THEIR PREPARATION.

### XXXI.—Apparatus and Materials used in the Preparation and Care of Products.

Fish cars and other floating cages for aquatic animals, including model of fish-marketman's car for the preservation of living fish; model of fish-car towed by the smack for keeping the catch alive; live-car, full size, for keeping fish alive; model of lobster-car for keeping live lobsters.

Ice-crusher, ice-picks, and tools used in handling ice in packing fresh fish for market, or storing them in the vessel's hold; model of refrigerator for preserving fish.

Model of fish wharf, with all the appliances for handling and curing dry fish, including scales for weighing, butts for pickling, flakes for drying, &c.; models of tilting and brush flakes; model of smoke-house for curing herring; models of sardine factory at Camden, Me, showing the interior arrangements of tables, elevators, &c.; model of lobster-boiling house at Boston, showing the vats for steaming the lobsters, the

ANDERSON, ABBOTT, & ANDERSON'S
PORTABLE FOLDING
BATHS.
PORTABLE REGULATION BUCKETS AND BASINS.
WATERPROOF
KIT AND CLOTHES BAGS.
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wharf, and the derricks used in handling the lobsters. It is accompanied by models of lobster smacks and of the principal forms of lobster nets. Model of Menhaden oil and guano factory, showing the apparatus by means of which the oil and guano are prepared. Model of fishery at Waukegan, Illinois, showing the apparatus employed in cleaning and salting down lake white-fish.

125. Apparatus used in the preparation of boneless fish, including mitre boxes, knives, cutting tables, box-nailing machine, nape-hooks, &c. Brand used by inspectors for marking barrels of pickled fish; oil bags, dippers, and other implements used in the manufacture of cod liver oil; model of guano mixer, employed in the fish-guano works for the purpose of thoroughly mixing the fish-scrap with the mineral phosphate and sulphuric acid.

126. Collection of cans, boxes, bags, and barrels for packing and transporting fish and oysters; box ends, sides, and covers, printed with the brands of boneless fish.

127. Samples of varieties of salt used in curing fish; exhibit showing the manufacture of cotton-seed oil, used to a considerable extent instead of olive oil for sardines, &c.

128. Several series of 30 by 40 inch photographs, showing the manner of handling and curing fish, landing from the vessels, drying, pickling, smoking, &c.; also showing the interior arrangements of canning factories, boneless fish factories, &c.

129. Models of apparatus used in steaming oysters.

XXXII.—Products of the Fisheries Prepared for Food.

130. Dry salted or plain dried preparations, including whole and boneless codfish and other species. Whale sinew used for food by the Chinese of California; dried meats of Abalone; Indian food, including dried Smelts, Salmon, Prawn, Shrimps, Cuttle Fish, Clams, &c.; Irish moss, &c.

131. Smoked preparations, including Halibut, Herring, Mackerel, Blue-Fish, White-fish, Salmon, Sturgeon, and Haddock, also varieties of fish prepared by the Indians and Eskimo.

132. Pickle or brine salted preparations, including Mackerel, Herring, Caviare, &c.

133. Preparations in spices, vinegar, &c., including Sardines, in mustard and tomatoes, Eels in jelly, Mackerel and Ocean Trout in mustard and tomato sauce, &c.

134. Preparations in oil, including American Sardines, &c.

LADIES'
LEVE ANTIPLUVIUM CAPES.
*For the Pocket. Only 10 oz. in weight.*
*Anderson, Abbott, & Anderson, Makers.*

eparations in cans, including fresh Codfish, Mackerel, ng, Bluefish, Sea Bass, Ocean Trout, Salmon, fish and chowders, Lobsters, Clams, Oysters, Shrimps, &c.
' crude, half bleached and bleached Irish moss *Chondrus* , used by cooks, confectioners, &c.

II.—PRODUCTS OF THE FISHERIES USED FOR CLOTHING.

urs, including skins, of fur-seal, sea-otter, &c., used for gloves, collars, cuffs, and trimmings.

-MATERIALS EMPLOYED IN THE ARTS AND MANUFACTURES.

nammals, including tusks of Walrus used for trinkets, s, jewelry, buttons, paper-knives, counters, &c.; ivory rwhal, *Monodon monoceros*, used for canes; teeth of Whale, *Physeter macrocephalus*, and their application manufacture of balls, buttons, and trinkets.
eptiles; teeth of Alligator, used for jewelry, whistles, andles, buttons, &c. An extensive trade in Alligator s carried on in Eastern Florida, several establishments engaged in their manufacture into fancy articles.
ammals, including Sperm Whale, jaw-bone made into s-rings, martingales, sail thimbles, pulley-blocks, seine-s, chopping-knife, &c.; "Os mirabilis" of Walrus, used rms, &c.; bone of fishes, including sword of Swordfish, *s gladius*.
whalebone, crude and prepared, for various uses. This ion includes slabs of whalebone of Bowhead Whale, *a mysticetus*, North-west coast Right Whale, *Balæna ii*, Humpback Whale, *Megaptera versabilis*, Sulphur-n Whale, *Sibbaldius sulfureus*, California Gray Whale, *anectes glaucus*, and other species; strips of bone ed by the Eskimo; also whalebone in condition to be n the manufacture of whips, brushes, hats, caps, canes, , and numerous other articles.
ell, *Éretmochelys squamata*, and commercial tortoise-shell manufacture of combs, knife handles, and other articles. fishes used in ornamental work, with specimens of and other articles manufactured.
nacre, embracing the pearl-yielding shells, with the and the mother-o'-pearl in the rough state, with the actured buttons, handles, and jewelry, pearl-powder,

RSON, ABBOTT, und ANDERSON
37, Queen Victoria Street, London, England.
FABRIKANTEN DER BESTE SORTEN VON
T KLEIDUNGSSTUECKE FUER SEE- ODER LAND-GEBRAUCH;
cken für Pferde- Wagen- Sonnenzelte, und ihr berühmtes Patentirtes Wasser-ichtes Tuch zur Ueberziehung von Kutscher- und Wagen-Decken.
iftlichen Zeugnisses des Herrn A. F. O. LIDDELL, vom Bureau des Minister des HOME OFFICE, 3. *September* 1878.
eben Jahren machten Sie mir einen Oelhaut Ueberzieher, welcher in ausgezeichnetem iesem Jahre im Gebrauche ist. (Gez.) A. F. O. LIDDELL.

inlaid work, and paper-maché, ornamented with mother-o'-pearl; ear-shells *Haliotidæ* used in manufacture of buttons, handles, inlaid work, and pearl powder; Pearl oysters *Aviculidæ*, with pearls and nacre; River Mussels *Unionidæ*, with pearls and nacre, crude and polished.

145. Cameo shell and shells of *Cypræa*, *Rotella*, *Oliva*, *Turritella*, &c., mounted as buttons and jewelry, composition shell work for box covers and frames, made by gluing shells in mosaic; cuttle-fish bone from *Sepia officinalis*, used as a pounce, as a dentifrice, as polishing powders, for taking fine impressions in counterfeiting, and as food for birds; concretions from the stomach of *Astacus*, known as "crab's-eyes" and "crab-stones," and used as antacids; shell of king-crab, *Limulus polyphemus*, used as a boat-bailer.

146. Alligator leather *Alligator mississippiensis*, salted and tanned, and manufactured into satchels, slippers, boots, &c. (See exhibit of Tiffany & Co. and H. J. Mahrenholz.) Skins of Eels, *Anguilla vulgaris*, Sturgeon, *Acipenser rubicundus*, Cod, *Gadus morhua*), Hake, *Phycis chuss*, Cusk, *Brosmius brosme*, and other species, crude, and manufactured into shoes, isinglass, &c. (See exhibits of Gloucester Isinglass and Glue Co. and Russia Cement Co.)

147. Isinglass (*ichthyocolla*), made from air-bladders and skins of fishes and used in the manufacture of fine glues and sizes, adhesive and court plasters, diamond cement, imitation glass, and table-jelly and confectionery, in refining wines and liquors, in adulterating milk, in fixing the lustre of artificial pearls, and in lustreing silk ribbons, (embracing the dried and the manufactured products) in their grades of "lyre," "heart-shaped," "leaf," and "book" isinglass. Hard and liquid fish-glue made from skins of Cod, Cusk, Hake, and other species; carriage axle, hats, oil-cloths, spools, &c., in the manufacture of which fish-glue is used. (See exhibits of Gloucester Isinglass and Glue Co. and Russia Cement Co.)

148. Specimens of American commercial sponges. (See invertebrate exhibit.)

149. Oils and fats, including Seal oil in its various grades, used for lubricating; Sea Elephant oil, crude and bleached; oil from body of whales, Grampuses, and Porpoises, used in the arts, for lubricating, painting, &c.; Black-fish and Porpoise jaw oil, used in lubricating fine machinery, watches, clocks, and guns; Grampus oil, used for lubricating fine machinery; crude and refined Sperm oil, used for illuminating, lubricating, as an emollient in medicine, for lip-salves, and in the manufacture of spermaceti; crude and refined spermaceti, with samples of candles from it: Alligator oil, made in Florida; oil from various species of fish, as Sunfish, *Mola rotunda*, currier's cod liver oil, medicinal cod liver oil; stearine from liver-oil of codfish; oil from liver of Cusk, *Brosmius brosme*, Haddock, *Melanogrammus æglefinus*, Pollock, *Pollachius virens*,

&c.; Menhaden oil, used in currying leather, in rope-making, for lubricating, for adulterating linseed oil, as a paint oil, and exported to Europe for use in the manufacture of soap and for smearing sheep; Oulachan oil, used by the Indians of the Northwest coast for food and illumination; oil of Squid, *Ommastrephes illecebrosus*.

ammal perfumes; ambergris from sperm whale, used in the preparation of fine perfumery.

iemical products and agents employed in the arts and medicine; fluid extract of seawrack, *Fucus vesiculosus*, extensively sold under the name of "Antifat."

ertilizers in the preparation of which fish are used, including Menhaden guano, crude and ground, guano made from fish skins, and from fish heads and bones. Series of preparations illustrating the manufacture of soluble Pacific guano, including crude and crushed, and ground South Carolina phosphates; crude Navassa phosphate, Sicily sulphur for the manufacture of sulphuric acid; Stassfurth kanite, used in preservation of scrap, crude Menhaden scrap, and scrap dried by the Hogle patent drying machine.—(See exhibits of Quinnipi Fertilizer Company, The George W. Miles Company, Winfield S. Dunan, W. A. Abbe, and others.)

## SECTION H.—FISH CULTURE.

### XXXV.—APPARATUS AND METHODS OF FISH CULTURE.

l map showing the operations of the United States Fish Commission from 1871 to the present time, the location of the hatching stations belonging to the United States Fish Commission, and to the Fish Commissions of the several States; and the dates of the establishment of the State Commissions. It also shows the locations where young fish have been planted, each species being designated by a peculiar symbol.

#### LIST OF HATCHING STATIONS.

he following is a list of the hatching stations operated by the United States Fish Commission in 1883:

1. Grand Lake Stream, Maine, station for collecting eggs of the Schoodic Salmon, *Salmo salar* var. *sebago*.
2. Bucksport, Me., station for collecting and hatching eggs of the Atlantic Salmon, *Salmo salar*, and for hatching eggs of White-fish, *Coregonus clupeiformis*, to be distributed in the waters of the State.
3. Wood's Holl, Mass. Permanent coast-station, which serves as a basis of operation for the scientific investigations of the Commission, and as a hatching station for eggs of the Cod, *Gadus morhua*, and other sea-fishes.
4. Gold Springs Harbour, Long Island, New York. Station for hatching eggs of various species of Salmonidæ for distribution in New York and vicinity.

5. Havre de Grace, Maryland, Station, located on Battery Island, in the Susquehanna River, for the purpose of collecting and hatching eggs of the Shad, *Clupea sapidissima*.
6. Washington, District of Columbia.
   *a*. National Carp Ponds. Ponds for the propagation of the three varieties of the Carp *Cyprinus carpio*, and the Gold-fish, *Cyprinus auratus*, the Golden Ides, *Idus melanotus* var. *auratus*, and the Tench, *Tinca vulgaris*.
   *b*. Arsenal Ponds. Ponds for the propagation of Carp *Cyprinus carpio*.
   *c*. Navy Yard. Station for collecting and hatching eggs of the Shad, *Clupea sapidissima*.
   *d*. Central hatching station. A station fully equipped for scientific experiments connected with the propagation of fishes. The station is also provided with apparatus for hatching the eggs of all the more important species, including light, heavy, and adhesive eggs. It is the principal distributing station of the Fish Commission, for both eggs and young fish to all portions of the United States.
7. Wytheville, Virginia. A station for hatching eggs of Brook-trout, *Salvelinus fontinalis*, and California Trout, *Salmo irideus*.
8. Saint Jerome's Creek, Point Lookout, Maryland. A station for the artificial propagation of the Oyster, *Ostrea virginiana*, the Spanish Mackerel, *Scomberomorus maculatus*, and the Banded Porgy, *Chætodipterus faber*.
9. Avoca, North Carolina. A station on Albemarle Sound, at the junction of Roanoke and Chowan Rivers, for collecting, hatching, and distributing eggs of the Shad, *Clupea sapidissima*, Alewife, *Clupea vernalis* and *C. æstivalis*, and Striped Bass, *Roccus saxatilis*.
10. Northville, Michigan. A hatching station for the development and distribution of eggs of the White-fish, *Coregonus clupeiformis*. This station is also provided with tanks and ponds for the spawning, hatching, and rearing of Brook-trout, *Salvelinus fontinalis*, and California Trout, *Salmo irideus*.
11. Alpena, Michigan. A station for the collection and development of the eggs of the White-fish, *Coregonus clupeiformis*.

ANDERSON, ABBOTT, & ANDERSON'S
**FISHING STOCKINGS AND BROGUES**
VERY LIGHT.] **ALL IN ONE.** [VERY STRONG.
37, Queen Victoria Street, London, E.C.

12. Baird, California.
    *a.* Salmon station. A station on the McLeod River for the development and distribution of eggs of the California Salmon, *Oncorhynchus chouicha.*
    *b.* Trout ponds. A station near Baird for collecting, developing, and distributing eggs of the California Trout, *Salmo iridea.*
13. Clackamas River, Oregon. A station on Columbia River for collecting and hatching eggs of the California Salmon, *Oncorhynchus chouicha.*

Hatching table, in three parts, showing models of the various kinds of hatching apparatus used in the United States, in actual working order, the water being supplied by means of a gas pumping-engine which forces it into closed pipes with a pressure of 15 lbs. to the square inch. Stop-cocks are placed at frequent intervals in these pipes, and are connected with the hatching apparatus by means of rubber tubing. The apparatus is supplied with natural and artificial eggs to give a better idea of its workings. The first compartment contains the closed apparatus, the next the trough and other apparatus requiring running water, while the third is arranged as a basin or artificial lake for showing the floating apparatus and other kinds used in open streams. A McDonald fish-way is placed at the end of the table to conduct the waste water to the tank below, from which it is again carried to the pump.

A figure representing a man in the act of taking eggs from an Atlantic salmon in a pan in which they are to be impregnated. By his side are casts of a ripe male and female salmon with the abdominal walls removed to show the ovaries and spermaries in position.

A model of the United States Fish Commission steamer "Fish Hawk," built by Pusey & Jones, of Wilmington, Delaware.

Sectional model of the United States Fish Commission steamer "Fish Hawk," on a scale of two inches to the foot, the hatching deck being properly equipped with fish-hatching apparatus, other apparatus being suspended from the vessel's side.

Models of several of the most important hatching houses in the United States, including the following:—

Model of hatching house built at Druid Hill Park, Baltimore, Maryland, in 1875, under the direction of Major T. B.

ANDERSON, ABBOTT, UND ANDERSON,
**37, Queen Victoria Street, London, England,**
Alleinige Fabrikanten der berühmten
"LEVE ANTIPLUVIUM" WASSERDICHTEN KLEIDUNGSSTÜCKE,
Welche in allen Klimas brauchbar sind.
Es ist dieses das leichteste Zeug der ganzen Welt für wasserdichte Herrn Röcke und Fischer-Stiefeln.

which is provided with troughs for hatching eggs
Salmon. The water enters the troughs through a fee
extending along the side of the room and escapes by
through the floor.

Model of United States hatching house at Nort
Michigan, built under the direction of Mr. Frank N.
for hatching eggs of Lake Trout, Brook Trout, Cali
Trout, California Salmon, and Whitefish. The interior
hatchery is provided with miniature hatching trough
jars, while in the grounds adjacent are shown several
fish tanks and ponds.

159. Maps showing topography of the land adjacent to sev
the more important hatching stations of the United
Fish Commission, including the national Carp ponds at
ington, District of Columbia, the United States reser
for fish-cultural purposes on the McCloud River, Calif
the salmon-breeding stations at Grand Lake Stream
Bucksport, Maine, and the hatching station at Nort
Michigan.

160. Series of 30 × 40 inch photographs, retouched with India
showing several of the more important hatching station
the more interesting features of fish-cultural work, su
taking and impregnating the eggs, tagging the fish, an
process of manipulation of the eggs and young fish
hatchery.

161. Series of fish-hatching apparatus, including all of the mor
portant kinds used in the United States. Each specim
this series is of actual size and in working order.

162. Series of accessory apparatus used at fish-hatching stations su
pans, skimming-nets, pails, dippers, and lanterns.

163. Series of apparatus for the transportation of eggs and young

series embraces all of the more important species hatched by the U.S. Fish Commission, including Brook Trout, Lake Trout, Atlantic Salmon, Schoodic Salmon, California Salmon, Rainbow Trout, Rangeley Trout, White-fish, Shad, Mackerel, Cod, Alewives, and Yellow Perch.

Series of young fish showing the rate of growth. This series includes the following species :—Brook Trout, Rainbow Trout California Salmon, Atlantic Salmon, White-fish, and Shad.

### XXXVII.—Fish Ways.

Models of all the more important styles of fish-way used in the United States, seventeen in number. Illustrations of the Shotwell process for cleansing streams from the refuse of gas-works.

### XXXVIII.—Fish Culturists.

Photographs of State Fish Commissioners.

Photographs of officers and members of the American Fish Cultural Association, and other representative fish culturists.

## Section I.—INVESTIGATION OF THE WATERS AND RESEARCH.

### XXXIX.—Deep-Sea Research.

A nearly complete series of the deep-sea sounding and dredging appliances, accessory apparatus, and instruments for physical observations, used by the United States Fish Commission, and United States Coast and Geodetic Survey, including the deep-sea trawls and dredges, towing-nets, sieves, water cup, sounding machine with piano wire sounding line and improved reversible metal cases for the Negretti and Zambra deep-sea thermometers. Models and photographs of the United States Fish Commission steamers "Albatross" and "Fish Hawk." Series of plates illustrating the deep-sea sounding and dredging appliances of the United States Coast Survey steamer "Blake."

Five relief models, showing the configuration of the sea bottom of the eastern coast of North America from Newfoundland to Mexico.

Chart showing the dredging operations of the United States Fish Commission, 1871–1882.

Series of specimens of marine invertebrates, obtained from the deeper waters off the north-eastern coast of the United States, since 1878, by the United States Fish Commission and the Gloucester Fishing Vessels, and representing some of the more interesting features of the fauna of that region. Specimens of rock formation from the deeper waters off the New England Coast.

### XL.—Investigation of the Fresh Waters.

174. Collections of crayfish and fresh water sponges from the rivers of the United States.

### Section K.—Literature.

### XLI.—Books.

175. Publications of the United States Fish Commission.
Publications of the State Fish Commission.
Publications of the United States Government relating to the fisheries.
Principal works of American writers on the marine and fresh water fauna of the United States, the geographical distribution, development, and life history of aquatic animals, and, in general, investigations upon seas, lakes, and rivers, and their inhabitants.

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## COLLECTIONS DISPLAYED BY SPECIAL EXHIBITORS.

[In the special catalogue of the United States Exhibition will be found many notes explanatory of the articles entered in competition by Special Exhibitors. The numbers in parenthesis refer to the classes in the official scheme.]

**ABBE, W. A.**, New Bedford, Massachusetts.
Samples of "Abbe's fish scrap." (29.)
Unground or crude Menhaden scrap.
Fine Ground Menhaden scrap.
Very fine ground Menhaden scrap.

**ADAMS, MAYHEW**, Chilmark, Massachusetts.
Patent chock for whale boat. (6.)

**AGASSIZ, ALEXANDER**, Museum of Comparative Zoology, Cambridge, Massachusetts.
Publications relating to fishes and marine invertebrates. (See also Museum of Comparative Zoology, Cambridge.) (55, 61.)
Plans of biological laboratory at Newport, Rhode Island. (40.)

**ANDERSON, ABBOTT et ANDERSON,**
**37, Queen Victoria Street, Londres, Angleterre,**
Renommés au Canada, en Australie, la Nouvelle Zélande, le Cap de Bonne Espérance, Natal, aux Indes et en Chine, comme uniques Fabricants de confiance des TOILES VERNIES propres à l'exportation, et dont l'arrivée à destination en bon état est garantie.

**AINSWORTH, STEPHEN H.**, New York.
Spawning-race for Salmonidæ. (35.)

**ALASKA COMMERCIAL COMPANY**, San Francisco, California. (London House, C. M, Sampson & Co., 64, Queen Street, Cannon Street, E.C.)
Two Pacific walrus tusks. (32.)
One 41 inches long and weighs 12¼ pounds.
One 41 inches long and weighs 12½ pounds.
Exhibit of fur-seal skins raw and dressed. (32.)

**ALBANY BEEF PACKING COMPANY**, 372 Greenwich Street, New York City.
Fish oils and fertilizers. (29.)
Fish oil.
Fertilizers and bone dust.
Cooked preparations in cans. (26.)
Canned Sturgeon (called Albany Beef), 1-pound cans.

**ALDEN, CHARLES**, Randolph, Massachusetts.
Exhibit of foods prepared by the Alden evaporating process. (26.)

**ALLEN, J. A.**, Museum of Comparative Zoology, Cambridge, Massachusetts.
Maps illustrating the geographical distribution of the seals and walruses. (55.)
Monograph of the Pinnipeds of North America. (60.)

**ALLEN, F. S.**, New Bedford, Massachusetts.
Bomb-lances formerly used with the whaling rifle, &c. (1.)

**ALLEN, FREDERICK S.**, Cuttyhunk, Massachusetts.
Model of Life-Raft (patented April 26, 1881). (6.)
Model of hand-capstan or windlass. (6.)
Model of hand-capstan. (6.)
Model of capstan or windlass. (6.)
Sword-Fish iron. Improved pattern. (1.)

**AMERICAN ANGLER (THE)**, W. C. Harris, Editor, New York City.
File of "The American Angler." (60.)

**ANDERSON, ABBOTT, & ANDERSON,**
Makers of the Waterproof
NAVY REGULATION COAT AND CAPE.
37 QUEEN VICTORIA ST., LONDON, E.C. WORKS—LIMEHOUSE, E.

**AMERICAN FIELD (THE)**, N. Rowe, Editor, Western Office, 155 and 157 Dearborn Street, Chicago, Illinois.
Bound volume of the American Field. (60.)

**AMERICAN FISH-CULTURAL ASSOCIATION**, New York City. George Shepard Page, President.
Annual reports and menus of annual dinners. (57.)
Portraits of its members.

**AMERICAN NET AND TWINE COMPANY**, Boston, Massachusetts.
Exhibit of Nets and Seines, and Twine used in their manufacture. (1 and 8.)

**AMERICAN SHIP WINDLASS COMPANY**, Providence, Rhode Island.
Working model of the Providence steam capstan windlass. (6.)

**AMS, MAX**, 372 and 374, Greenwich Street, New York City.
Preparations in spices, vinegar, &c. (26.)
Eels in jelly, in cans.
Smoked preparations. (26.)
Smoked Eels.
Pickle or brine salted preparations. (27.)
American Caviare (Sturgeon roe).
Cooked preparations in cans. (26.)
Canned Sturgeon (called Albany Beef).

**ANNIN, JAMES, JUN.**, Caledonia, New York.
Box for the transportation of fish ova. (35.)
Case containing 3000 living eggs of the Brook Trout. *Salvelinus fontinalis.* (36.)

**ATKINS, CHARLES G.**, Bucksport, Maine.
Apparatus used in the artificial propagation of various species of Salmonidæ. (35.)
Series of eggs and young of Atlantic Salmon, showing daily growth from the newly-impregnated egg to the fry several weeks old. (36.)
Model of Pike's spiral fish-way, with modifications; also model of Atkins's Bangor fish-way. (37.)

**ATWATER, PROF. WILBUR O.**, Middletown, Connecticut.
Diagrams and publications relating to the nutritive value of fish. (25.)

ANDERSON, ABBOTT, AND ANDERSON'S
LEATHER LINED FISHING BOOTS REQUIRE NO DRESSING.
37, Queen Victoria Street, London, E.C.

**BROTHERS**, Clayton, New York.
; model of Atwood's patent centre-board for boats and
. (6.)

**T & CO.**, and **TILLÁMOOK PACKING COM-**
ıtoria, Oregon.
›reparations in cans. (26.)
d Salmon.

**& LOUD**, Boston, Massachusetts.
for fishing vessels. Harcourt's patent improved
iron-strapped block. (6.)
oller bushing. (6.)
er bushing. (6.)
d lug-roller with iron sheave. (6.)
ıail cleat and downhaul attachment. (6.)
d snatch-block. (6.)
›r peak halyards. (6.)
d sheet-block with boom buffer combined. (6.)
d trawl roller. (6.)
d seine block. (6.)

**.RTHUR H., & CO.**, Boston, Massachusetts.
›reparations in cans. (26.)
Bluefish. Fresh Sea Bass. Fresh Mackerel. Fres'ı
› Sea Salmon. Ocean Trout.
preparations. (26.)
ı Haddies. Kippered Herring.
ions in spices, vinegar, &c. (26.)
rel in Mustard Sauce. Mackerel in Tomato Sauce.
ın Trout in Mustard Sauce. Ocean Trout in Tomato
›e. Nantucket Sturgeon in Piccalilli Dressing.

**'ILLIAM L., PASSED ASSISTANT ENGI-**
**S.N.**, Steamer "Fish-Hawk."
ıstering thermometer for deep-sea research. (40.)

**C, I. H. & SONS**, New Bedford, Massachusetts.
whale-boat, rigged for use. (4.)
ıd refined whale oil. (29.)
ıd Humpback Whale-bone. (32.)

**C, JOHN**, Cambridge, Massachusetts.
ıphy of Angling. (60.)

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**ıeen Victoria Street, Londres, Angleterre,**

SEULS FABRICANTS DES CÉLÈBRES

**NTS IMPERMÉABLES "LEVE ANTIPLUVIUM,"**

Adaptés à tous les climats,

.ts et de Guêtres imperméables pour la Pêche; le plus léger tissu

**BEARDSLEY'S SONS, J. W.**, 179 West Street, New York City.
Dry salted preparations (26.)
Beardsley's shredded Codfish. Boneless Codfish, Beehive brand. Boneless Herring, Star brand.

**BEAN, TARLETON H.**, United States National Museum, Washington.
Map showing geographical distribution of the food-fishes of Alaska. (55.)
Publications on ichthyology and the fisheries. (55, & 61.)

**BENEDICT, J. E.**, United States Steamer, "Albatross."
Rake-dredge for collecting Annelids and other mud-burrowing invertebrates. (40.)

**BLACKFORD, EUGENE G.**, Fulton Street, New York City
Fresh food-fish on ice, the supply received from week to week. (51.)
Invitations to annual "trout-openings."

**BLISS, JOHN, & CO.**, New York City.
Nautical instruments. (6.)
Taffrail log. (Complete.)
Parallel rules; two sizes, new style.
American chronometer, "John Bliss and Co., No. 2768"—described in accompanying "Nautical Almanac."

**BOOTH, A.**, Baltimore, Chicago, and Astoria.
Preparations in spices and vinegar, &c. (26.)
Oysters in glass.
Cooked preparations in cans. (26.)
Canned Oysters. Canned Salmon. (Oval brand.)

**BRACKETT, E. A.**, Winchester, Massachusetts.
Model of Fish-way, with partitions at right angles, provided with a submerged piece of cob-work, surmounted by grating, to direct the fish to the mouth of the way. (37.)
Floating box for use in open stream. (35.)

**BRACKETT, WALTER M.**, Boston, Massachusetts.
Paintings of fish. (51.)

**BRAND, JUNIUS A.**, Norwich, Connecticut.
Bomb-lances and darting bomb for killing whales. (1.)

**ANDERSON, ABBOTT, & ANDERSON'S**
**PONCHO WATERPROOF**
Affords absolute protection when Riding. Much used in Brazil and other Tropical Countries.
Also makes an excellent Ground Sheet.

**REWER, JAMES D.**, Muncy, Pennsylvania.
Model of fish-way, with transverse sloping floors; also model of oblique groove fish-way. (37.)

**ROWN, JAMES TEMPLE**, United States National Museum, Washington.
Collection of whaling harpoons, lances, guns, bombs, &c., gathered for the Fish Commission at New Bedford in 1882. (1.) (The entire whaling collection has been arranged by Mr. Brown.)

**RYAN, OLIVER N.**, Occokeek, Maryland.
Floating box for use in open stream. (35.)

**URNHAM & MORRILL**, Portland, Maine.
Smoked Preparations. (26.)
Finnan Haddies, in 1-pound cans.
Cooked preparations in cans. (26.)
Canned Lobsters, Mackerel, and Clams.

**UTTRICK, J. T.**, New Bedford, Massachusetts.
Ship bread carried by whalemen. (22.)

**ARPENTER, CHARLES**, Kelley's Island, Ohio.
Camel's-back buoy for gill nets. (6.)

**ASTINE PACKING COMPANY**, Castine, Maine.
Cooked preparations in cans. (26.)
Lobsters, Mackerel, Soused Mackerel, Halibut, Clams, Clam Powder.
Pickle or Brine-Salted Preparations. (26.)
No. 5 Messed Mackerel, one dozen cans.

**ENTURY COMPANY, THE**, New York City, Art Department, A. W. Drake, Superintendent.
Illustrating the United States Life-Saving Service. (9.)

1. Off to a wreck. 2. Life-saving station. 3. Drill, &c., in surf-boat. 4. Launching surf-boat. 5. Night patrol. 6. Burning a signal. 7. Hauling mortar-car. 8. Surfman with life-belt. 9. Firing the mortar. 10. Breeches-buoy in operation. 11. Breeches-buoy. 12. Self-righting life-boat. 13. Self-righting life-boat under sail. 14. Life-saving dress. 15. Tally-board and whip-block. 16. Resuscitation, ejecting water. 17. Resuscitation, restoring respiration. 18. Medicine chest. 19. Mess-room.

Pictures of other marine scenes.

20. A glimpse of the sun. 21. Hove to for a pilot. 22. Launching the boat. 23. Taking a Porpoise aboard. 24. Sebatis in a perilous condition. 25. Beaching the canoe. 26. Reefing the mainsail.

**CHASE, A. J.**, Boston, Massachusetts.
Chase's Cold Blast Refrigerator. (33.)
Chase's Monitor Display Refrigerator. (33.)

**CHASE, OREN M.**, Detroit, Michigan.
A glass hatching jar, provided with a glass tube, by means of which the water is delivered at the bottom and allowed to pass upward through the eggs. (35.)

**CHESTER, CAPTAIN H. C.**, Noank, Connecticut.
Walrus tusks scrimshawed, and frame made of walrus ivory. (32.)
Cylinder and box used in hatching floating eggs, first employed in hatching cod at Cape Ann in 1878. (35.)
Rake-dredge, and other apparatus used in deep-sea research.

**CLARK, A. HOWARD**, United States National Museum, Washington.
Map illustrating the past and present locations of the whaling-grounds of the world; publications on fishery statistics. (55 and 61.)

**CLARK, FRANK N.**, Northville, Michigan.
Series of eggs and young fish, showing development and growth as follows: Brook Trout, Rainbow Trout, Schoodic Salmon, and White-fish. (36.)
Various kinds of apparatus used in hatching White-fish and various species of Salmonidæ; also box for the transportation of fish ova. (35.)

**CLARK, JAMES B.**, Chester, Connecticut.
Working model of W. N. Clark's patent rudder hanger. (6.)

**COLE, CHARLES A.**, Scituate, Massachusetts.
Specimens of commercial carrageen, or Irish moss *Chondrus crispus*. (32.)
*a.* Moss as it comes from the rocks.
*b.* Moss partly bleached.
*c.* Moss bleached for market.

**COLE, LUTHER**, New Bedford, Massachusetts.
Nickel-plated whaling instruments. (1.)

**COLLINS, A. S.**, Caledonia, New York.
Spawning race for Salmonidæ. (35.)

**COLLINS, CAPTAIN J. W.**, Gloucester, Massachusetts.
Drawings of fishing scenery (see also under Elliott).
Charts of the fishing grounds.
Collins's improved adjustable marine drag. (6.)
Collins's patent fog alarm. (6.)
This invention consists of an upright cylindrical bellows of stout grain leather, supported by and working upon three brass rods, which are

**LLINS, CAPTAIN J. W.**—*continued.*

fastened at the lower ends to a strong wooden pedestal, and the upper ends of which are secured by means of screw caps to a wooden top, to which also is attached the upper part of the bellows. This wooden top or cap-piece is surmounted by a brass cone, having a hole in its apex, into which is screwed a reed horn. The bellows is collapsed or distended by means of an iron lever working on a hinge attached to the wooden base. By moving this lever the air in the bellows is driven with great force through the horn at the top. A very heavy sound is obtained when a large horn is used, while a small horn can be blown to its fullest capacity with very slight exertion on the part of the operator. Dimensions: Diameter of base, 2 feet; thickness, 4 inches; diameter of wooden top, 19 inches; thickness, 1½ inches; diameter of bellows (No. 56,955), 15 inches; height, 20 inches; height of brass cone, 6½ inches; diameter of cone (at base), 9 inches; thickness of brass rods, ⅜ of an inch; length of lever, 4 feet. This implement was originally designed for use on fishing vessels, especially such as are employed in the line-trawl fishery. In the latter fishery the men go out in dories long distances (one to three miles) from the schooners that are lying at anchor, and the prevalence of dense fogs in summer, and snow in winter, causes the loss of many fishermen, who go astray because they are unable to hear the horns which are ordinarily employed. The advantages of this fog alarm are that it can be heard farther than any horn now in use on sailing vessels (this having been proved by actual test at sea); that the material of which it is made, and the simplicity of its construction, render it less liable to get out of repair than other patent horns; that it may be at all times operated with comparatively slight physical exertion, and without any of the exhaustion that results from blowing a horn with the mouth; and finally, that it is adapted for use on all kinds and classes of vessels.

Model of ideal fishing schooner. (See Collective Exhibit.)
Publications relating to the fisheries. (60.)

**LLINS, PAUL E.**, Boston, Massachusetts.
Oil painting, "Mackerel hook and line fishing." (1.)

**MSTOCK, HARRY**, Fulton, New York.
"Flying Helgramites" for bass bait. (16.)

**NKLIN, Captain B. F.**, Jamesport, New York.
Sketches illustrating the Menhaden fishery, including (57.)-
1. Setting the seine. 2. Hauling the seine. 3. Scooping out the fish. 4. Floating factory Algonquin. 5. Boats going out to fishing grounds. 6. Working to windward of shoal. 7. Encircling the school. 8. Pursing, and fish striking the seine. 9. A loaded carry-away boat in good breeze. 10. A big strike, &c.

**NDERSON, ABBOTT, UND ANDERSON,**

**37, Queen Victoria Street, London, England,**

rühmt für ihre OELHAUT-FABRIKATEN in allen Fischerei
stricten in Canada, Neufundland, Schweden, Norwegen, Hol-
d, Frankreich und im ganzen Britischen Reich.

**CONROY & BISSETT,** 65 Fulton Street, New York City.

1 Hexagonal split bamboo Salmon rod, German silver mountings, 18 feet long. (14.)

1 Hexagonal split bamboo Grilse rod, German silver mountings, 15 feet long. (14.)

1 Hexagonal split bamboo Trout and Black Bass fly rod, German silver mountings, 12 feet long. (15.)

1 Hexagonal split bamboo Trout and Black Bass fly rod, German silver mountings, 11 feet long. (15.)

1 Hexagonal split bamboo Saint Lawrence rod, German silver mountings, 10 feet long. (15.)

1 Hexagonal split bamboo McGuiness' Black Bass rod, German silver mountings, 11½ feet long. (15.)

1 Hexagonal split bamboo California general rod, making 3 distinct rods, German silver mountings, 8½ to 12½ feet long. (15.)

1 Hexagonal split bamboo "Newport," or heavy Bass rod, ash butt, agate tube top. (15.)

1 Hexagonal split bamboo "Holberton" fly rod, 2 pieces, and short ash butt. The joints of this rod are contained in the landing-net handle; the butt and folding landing net can be carried in the angler's pocket. (15.)

1 Hexagonal split bamboo "Henshall" Black Bass minnow rod, 8½ to 9 feet long. (15.)

1 Hexagonal split bamboo southern Bass or Weak-fish rod, 9 to 9½ feet long. (15.)

**COOK, CAPTAIN CALEB,** Provincetown, Massachusetts.

Exhibit of crude and refined oils from Beluga, Porpoise, and Black-fish. Watch and clock oils prepared from jaw oil of Porpoise. (29.)

**COOK, H. & S., & COMPANY,** Provincetown, Massachusetts.

Builder's model of Grand Bank fishing schooner "Lizzie W. Mattheson." (4.)

**CUTTING PACKING COMPANY,** San Francisco, California.

Cooked preparations in cans. (26.)

Fresh Salmon from California, Oregon, and Alaska streams.

This exhibit contains Alaska Salmon, probably the first ever shipped abroad. One can contains one fish, live weight eighty-six pounds; dressed, sixty-five pounds; the largest on record on this coast; caught at the company's cannery, at the mouth of the Kusiloff River, Alaska, July 22, 1882.

**DALL, CAPTAIN W. H.,** United States Coast Survey, Washington.

Map showing geographical distribution of fur-bearing animals of Alaska, charts and publications upon the hydrography, meteorology of the North Pacific, and upon its marine fauna. (40, 55.)

**AVIS, FRANK, E.**, Gloucester, Massachusetts.
Davis' Standard Rowlocks, plain brass and polished brass; twenty specimens. (6.)

**E BUTTS & DAGGETTS**, Boston, Massachusetts.
Cooked preparations in cans. (26.)

**E LAWDER, W. G.**, Easton, Maryland.
Spawning-box for Salmonidæ and other fresh-water species.

**OBBINS, D. P.**, Buffalo, New York.
Self-righting, Self-baling, Self-ballasting Life Boat. (9.)

**ODD, A. W., & COMPANY**, Gloucester, Massachusetts.
Exhibit of fish oils, stearine, and guano. (27 and 29.)
Pure cod liver oil for medicinal use.
Blackfish oil, refined for morocco.
Cod oil, "Newfoundland," for tanners' and curriers' use.
Cod oil, "Labrador," for tanners' and curriers' use.
Cod oil, "Grand Bank," for tanners' and curriers' use.
Cod oil, "Shore," for tanners' and curriers' use.
Menhaden oil, "cold pressed," for tanners' and curriers' use.
"Cod oil stearine," for tanners' or soap-makers' use.
"Menhaden oil stearine," for tanners' or soap-makers' use.
Fish guano.

**ONNELL, J. T.**, Bath, Maine.
Cable used by fishing vessels. (5.)

**UNAN, WINFIELD S.**, Baltimore, Maryland.
Exhibit of Menhaden oil and scrap. (29.)
1. Unground or crude Menhaden scrap; made of fish two years old and over, called large fish.
2. Ground Menhaden scrap; made from the same stock as No. 1.
3. Unground or crude Menhaden scrap; made of fish not over one year old, called small fish.
4. Ground Menhaden scrap; made of same stock as No. 3.
5. Samples of Menhaden oil; two qualities.

**ARLL, R. EDWARD**, Washington.
Series of eggs of Codfish, showing daily development from the unimpregnated egg to the time of hatching. (36.)

VATERPROOF FISHING COATS,
TO SHORTEN AT PLEASURE, AND WITH INNER CUFFS
TO PREVENT WATER RUNNING UP.
ANDERSON, ABBOTT, & ANDERSON,
17, Queen Victoria Street, London, E.C.

**EARLL, R. EDWARD**—*continued.*
Publications relating to the fisheries, fishing statistics, and fish culture.

**EGGERS, SELMAR**, New Bedford, Massahusetts.
Whaling gun. (1.)

**ELLIOTT, HENRY W.**, Washington.
Series of water-colour sketches, illustrating the fur-seal fisheries of Alaska; report upon the natural history and of the fur seal and the seal fisheries of Alaska; sketches in Indian ink illustrating fisheries of various parts of the United States.

**ELLIOTT, HENRY W., & COLLINS, J. W.**
Pictures of various scenes in the New England fisheries.

**EMERTON, J. H.**, Peabody Museum, Yale College, New Haven, Connecticut.
Models of Giant Squid and Giant Octopus shown in the Collective Exhibit. (16.)

**EVERLETH, F. M.**, Waldoboro, Maine.
Model of fish-way, with automatic float for regulating the supply of water. (37.)

**EVERSON, JAMES L.**, Williamsburg, New York.
"Shadow Canoe," with sails, for cruising, fishing, or hunting. (20.)

**FAIRBANKS & COMPANY**, New York City.
Scales used in weighing fish and in scientific investigation. (34.)

**FARLOW, PROF. W. G.**, Harvard College, Cambridge, Massachusetts.
Collective exhibit of North American Algæ with publications. (42.)
Investigations of the red algæ infesting dried fish, with specimens of red fish and red salt. (42.)

**FAXON, WALTER**, Museum of Comparative Zoology, Cambridge, Massachusetts.
Publications upon marine invertebrates. (61.)

LIFE BELTS AND VESTS.
No person should venture to Sea without them.
ANDERSON, ABBOTT, AND ANDERSON,
37, QUEEN VICTORIA STREET, LONDON, E.C.

**FERGUSON, ALBERT,** 65 Fulton Street, New York City.
Lanterns and Reflectors for Angler's use. (19.)

**FERGUSON, MAJOR T. B.,** Assistant United States Fish Commissioner, Washington.
Various kinds of apparatus used in hatching heavy eggs; also transportation case for young fish. (35.)

**FEWKES, J. WALTER,** Museum of Comparative Zoology, Cambridge, Massachusetts.
Publications upon marine invertebrates. (60.)

**FOREST AND STREAM PUBLISHING COMPANY,** 39 and 41 Park Row, New York City.
A series of nineteen bound volumes of the weekly paper "Forest and Stream and Rod and Gun." (60.)

**FOSTER, AL.,** New York City.
Placards advertising fishing excursions in the vicinity of New York.

**FREEMAN, MRS. CAPT. J. H.,** Wellfleet, Massachusetts.
Crayon sketch of Mackerel. (51.)
Oil painting of Salmon Trout. (51.)

**FULTON MARKET FISHMONGERS' ASSOCIATION,** New York City.
Portraits of its members. (33.)

**GLOUCESTER ISINGLASS & GLUE COMPANY,** Gloucester, Massachusetts.
Exhibit of Liquid Isinglass for adhesive paper, labels, and envelopes; isinglass for court plasters; Pure Fish Glues (hard and liquid, free from salt), for leather belting, roll cots, and card pelting, &c. (29.)

**GOODE, PROF. G. BROWN,** Smithsonian Institution, Washington.
Charts showing geographical distribution of fishes. (55.)
Publications relating to Ichthyology and the fishermen. See also under Charles Scribners, Sons. (Game Fishes.)

**GREEN, MONROE A.,** Mumford, Monroe County, New York.
Samples of barbless hooks for Trout and Bass fishing. (18.)
Box for the transportation of fish ova. (35.)

**GREEN, SETH,** Rochester, New York.
Hybrid between California Salmon and Brook Trout; hybrid between Salmon Trout and Brook Trout. (36.)
Floating Hatching box for use in rivers or streams. (35.)

**HARGER, OSCAR,** Peabody Museum, Yale College, New Haven, Connecticut.
Publications upon Isopod Crustaceans. (61.)

**HAVEN, WILLIAMS & CO.**, New London, Connecticut.
Whale oils. (29.)

**HAYWOOD, WILLIAM P.**, West Creek, Ocean County, New Jersey.
Model of Oyster Tongs. (2.)

**HENDLEY, J. E.**, United States National Museum, Washington.
Plaster cast of negro fisherman. (21.) (The lay figures in the collective exhibit of the United States, with the exception of the whalemen, were made by Mr. Hendley.)

**HIGGINS & GIFFORD**, Gloucester, Massachusetts.
Higgins and Gifford's life-saving surf-boat. (9.)
Model of life-boat. (9.)
Model of fish wharf. (7.)

**HILGARD, PROF. J. E.**, Superintendent U.S. Coast Survey, Washington.
Ocean salinometer and optical densometer. (40.)

**HILL & CO., L. S.**, Grand Rapids, Michigan.
Frame containing samples of Hill's Spoon Baits. (14-16.)
Frame containing an illustrated card of Hill's Baits with commendations, &c. (14-16.)

**HINE & CO.**, 13 and 15, Doyers Street, New York City.
Cooked preparations in cans. (26.)
Terrapin Soup. Green Turtle Soup. Terrapin Stew.

**HOLBERTON, WAKEMAN**, 65, Fulton Street, New York City.
Full length Holberton Fly books. (14–16.)

**HOLMES, FRANK**, Chagrin Falls, Ohio.
Stranahan folding canvas boat, length 10 feet. (20.)

**HOLMES, MARSHALL H.**, 1123 Arch Street, Philadelphia.
Holmes's Life-Preserving Bed, constructed of solid cork and cork shavings, and available as a float for a single person. (9.)

**HOOPER, WILLIAM, J., SONS**, Baltimore, Maryland.
Netting of all kinds. (8.)

**HORNADAY, W. T.**, Taxidermist, United States National Museum, Washington.
Specimens of Taxidermy. (53.)
Walrus Head.
Quinnat Salmon (in collective exhibit).

Specially suitable for Sportsmen, as it combines perfect ventilation, with absolute protection both to the wearer and the Gun.

THE "BUCKLAND" COAT. (REGISTERED.)

MAKERS,
37, QUEEN VICTORIA ST., LONDON, E.C.
ANDERSON, ABBOTT, AND ANDERSON.

**UME, WILLIAM,** Astoria, Oregon.
Cooked preparations in cans. (26.)
Canned Salmon.

**CHTHYOPHAGOUS CLUB,** New York City. John Foord, Esq., President.
Collection of menus of annual dinners of the club. (60.)

**RVING, THOMAS A.,** Gloucester, Massachusetts.
Model of Three-masted Fishing Schooner. (4.)

**ORDAN, PROF. DAVID S.,** Indiana University, Bloomington, Indiana.
Works on Ichthyology. (56.)

**OSEPH, DAVIS & CO.,** 233 W. Seventh Street, Cincinnati. Ohio, and Fitzroy Works, 6 Kennington Park Road, S.E., London.
American Forecast Barometer. (6.)

**EWIS, W. K. & BROS.,** Boston, Massachusetts.
Cooked preparations in cans. (26.)
Lobsters. Clams. Mackerel. Fish-chowder. Clam-chowder. Fishermen's food. (22.)
Roast Mutton. Roast Beef. Roast Turkey. Roast Chicken.

**OCKINGTON, W. N.,** Philadelphia, Pennsylvania.
Publications on marine fishes and invertebrates. (55 & 61.)

**OOMIS, PLUMB & CO.,** Syracuse, New York.
Bronze Plate Automatic Reel, for 90 feet of line, No. 1. (14–16.)
Nickel Plate Automatic Reel, for 150 feet of line, No. 2. (14–16.)

**ORD, H. & G. W.,** Boston, Massachusetts.
Exhibit of cotton netting used in the manufacture of seines, traps, dip-nets, &c. (8.)

**OW, DAVID W.,** Gloucester, Massachusetts.
Low's Improved Ice-Crusher. (33.)

**UCAS, F. A.,** United States National Museum, Washington,
Exhibit of stuffed Turtles, &c. (52.)

**YLE LIEUTENANT D. A.,** United States Army.
Improved gun for making connection with wreck from shore. (9.)
Exhibit of stuffed Crabs and Lobsters. (51.)

**cDONALD, MARSHALL,** Washington.
Various kinds of apparatus used in hatching adhesive floating and heavy eggs; also apparatus for the transportation of eggs and young fish. (35.)
Series of eggs and fry showing development and growth as follows: Brook Trout, Lake Trout, and White-fish. (36.)

**McDONALD, MARSHALL**—*continued.*

Model of counter-current fish-way, the partitions being so arranged that the velocity of the current is retarded by the water being turned against itself. (37.)

Publications upon fish-culture.

**McGOVERN, H. D.**, Brooklyn, New York.

Stuffed trout, and bug which killed it. (49.)

**McKESSON & ROBBINS**, 91 Fulton Street, New York City.

Collection of Florida Sponges. (43.)

Collection of cultivated Sponges. (36.)

**McLELLAN, LIEUTENANT, C. H.**, United States Revenue Marine. (9.)

Improved traveller block for breeches buoy. (9.)

Improved block for sand anchor. (9.)

Improved breeches buoy. (9.)

Improved tripod for life-saving apparatus. (9.)

Improved tally boards for life-saving apparatus. (9.)

Improved drill or tactics for life-saving crews. (9.)

**McMENAMIN & CO.**, Hampton, Virginia.

Cooked preparations in cans. (26.)

Fresh Devilled Crabs. Fresh Devilled Crabs. Fresh Crab Meat. Fresh Crab Meat. Extra selected Oysters, Lion brand. Extra selected Oysters, Lion brand. Extra cove Oysters, Hampton Roads brand. Cove Oysters, Hampton Roads brand. Cove Oysters, Hampton Roads brand. Lunch Oysters.

**MAHRENHOLZ, H. J.**, New York City.

Boots and shoes made of alligator leather. (32.)

**MANN, JOHN, & CO.**, Syracuse, New York.

Artificial trolling spoons. (14–16.)

**MANN BROS.**, Chicago, Illinois.

Packages for transporting oysters. (33.)

**MARSHALL, HENRY**, U.S. National Museum, Washington.

Mounted group of aquatic birds.

**MASON, H. W.**

Explosive and non-explosive projectiles for killing whales. (1.)

For Watering Gardens and Lawns, Washing Carriages, Floors, and Ships' Decks, and all necessary

INDIA-RUBBER HOSE,

Fittings, etc.

37, QUEEN VICTORIA ST., LONDON, E.C.

ANDERSON, ABBOTT, & ANDERSON.

**ASSACHUSETTS HUMANE SOCIETY.**
Reports of the Massachusetts Humane Society. (9.)
Medals for Life-Saving Service granted by the Massachusetts Humane Society. (9.)

**ATHER, FRED.**, New York City.
Conical apparatus used in hatching eggs of the Shad; also boxes and cans for the transportation of fish and fish ova. (35.)
Collection of fishes from the Adirondack region, with map showing distribution of species, and report. (51, 55.)

**MATHER, Mrs. FREDERICK**, of New York City.
Oil Painting of a Trout. (51.)

**MAYO, HENRY, & CO.**, Boston, Massachusetts.
Pickle or brine salted preparations. (26.)
Paragon Mess Mackerel. Perfection Mess Mackerel. Standard Mess Mackerel. Breakfast Mess Mackerel. Family Mess Mackerel.
Preparations in spices, vinegar, &c. (26.)
Soused Mackerel, 1-pound, 2-pound, 3-pound, and 4-pound cans.
Cooked preparations in cans.
Fresh Mackerel. Fresh Mackerel in Tomato Sauce. Fresh Mackerel in Tomato Sauce. Fresh Mackerel in Mustard. Fresh Mackerel in Mustard. Fresh Salmon. Fresh Lobsters. Clam Chowder. Fish Chowder. Green Turtle Soup. Fresh Clams. Codfish balls.
Fishermen's food in cans. (22.)
Baked Beans, Bean-pot brand; Picnic Beans, Bean-pot brand; Green Lima Beans, Bean-pot brand; Green Lawnsdale Beans, Bean-pot brand; Green Corn, Green Peas, Fresh Pumpkin, Fresh Squash, Fresh Tomato, Fresh Succotash, Roast Beef, Roast Lamb, Roast Turkey, Roast Chicken, Beef Soup, Chicken Soup, Macaroni Soup, Mock Turtle Soup, Mutton Soup, Ox-Tail Soup, Pea-Soup, Tomato Soup.

**MEGLER, J. G., & Co.**, Brookfield, Wahkiakum County, Washington Territory.
Cooked preparations in Cans. (26.)
California Salmon.

**MERCHANT, GEORGE, JUN.**, Gloucester, Massachusetts.
Model of Mackerel pocket. (1.)
Fishermen's games and puzzles. (21.)

**MILAM, B. C.**, Frankfort, Kentucky.
Milam or Frankfort Fishing Reel. (14-16.)

**MILES.** (See under THE GEORGE W. MILES COMPANY.)

**MILLER BERTH AND LIFE-SAVING MATTRESS COMPANY, THE,** Boston, Massachusetts. Capt. Benj. F. Flinn, Agent.

Life-Saving Mattress. (9.) (Patented December, 1880.)

**MILLS & SON, WILLIAM,** 7, Warren Street, New York City.

Leonard's split bamboo rods:

Salmon rod: 16 feet, 32 ounces. (14.) Salmon rod: 15½ feet, 26 ounces. (14.) Bass bait rod: 10¾ feet, 15¾ ounces. (16.) Bass bait rod: 8¼ feet, 9¾ ounces. (16.) Trout fly rod: 11½ feet, 8¾ ounces. (15.) Trout fly rod: 10½ feet, 8½ ounces. (15.) Catskill rod: 10 feet, 4⅞ ounces. (14-16.) Trunk fly rod: 11 feet, 10¼ ounces. (14-16.) Combination rod: (14-16.)

Salmon reels: Leonard's patent. (14.)

Trout reels: Leonard's patent. (15.)

Salmon reels. (William Mills & Son's new patent.) (14.)

Trout reels. (William Mills & Son's new patent.) (15.)

Multiplying reels: (B. H.) adjustable click, three sizes, 2, 3, and 4, in rubber and German silver. (14-16.)

Braided linen lines. (B, C, D, E, F, G.)

Salmon lines: standard tapered silk (B and C), 120 yards each. (14.)

Fly lines: standard level silk (E, F, and G), 100 yards each. (14-16.)

Braid-silk lines: standard (C, D, E, F, G, and H), 50 yards each. (14-16.)

Fly lines: standard tapered silk (F), each 30 and 50 yards. (14-16.)

Fly lines: standard tapered (E), each 25 and 40 yards. (14-16.)

Leaders: single, double, and twisted, Nos. 1 to 8; lengths, 3 feet, 6 feet, and 9 feet. (14-16.)

Flexible Minnows: Nos. 2, 3, 4, 5, 6, 7, 8. (14-16.)

Caledonian Minnows: Nos. 3, 4, 5, 6, 7, 8, 9, 10. (14-16.)

Phantom Minnows: Nos. 5, 6, 7, 8. (14-16.)

Protean Minnows: Nos. 4, 5. 6. (14-16.)

Artificial Dobson: large and small. (14-16.)

Artificial frogs: large and small. (14-16.)

Artificial Crawfish, Grasshopper, Cricket, and May-fly. (14-16.)

Lone Star Baits. (14-16.) Eclipse Baits. (14-16.) Bates' Patent Spinner. (14-16.) Minnow Gangs: five styles. (14-16.) Leonard Click Reel. (14-16.) Billinghurst Reel. (14-16.) Bass and Trout Hooks. Virginia Hooks. Blackfish Hooks. Tapered-point Blackfish hooks. Aberdeen Hooks. Sneck Hooks. Sproat Hooks. Chestertown Hooks. Central Draught Hooks. Bright Treble Hooks. Spring Shank Treble Hooks.

**MITCHELL, WILLIAM,** 26 Vandam Street, New York City.

Salmon rods; five varieties. (14.)

Front rods; twelve varieties. (15.)

**MITCHELL, WILLIAM**—*continued.*

**Bass rods**; five varieties. (16.)
**Salmon reel**; one sample. (14.)
**Trout reel**; one sample. (15.)
**Bass reels**; two samples. (16.)

TROUT FLY RODS.

| | Length. | Weight. | Reel and Line. | Leverage. |
|---|---|---|---|---|
| | *Feet.* | *Ounces.* | *Ounces.* | *Ounces.* |
| No. 1 | 12 | 9½ | 6½ | 30 |
| No. 2 | 11½ | 7½ | 5 | 26 |
| No. 3 | 11 | 6½ | 4¾ | 22 |
| No. 4 | 10 | 4½ | 3½ | 16 |
| No. 5 | 9½ | 4 | 3½ | 13 |

SALMON RODS.

| Length. | Weight. | Reel and Line. | Leverage. |
|---|---|---|---|
| | *Ounces.* | *Ounces.* | *Ounces.* |
| 14 feet | 17 | 19½ | 20 |
| 16 feet | 26 | 22 | 47 |
| 16½ feet | 28 | 22 | 50 |
| 17 feet | 30 | 22 | 64 |
| 18 feet | 35 | 22 | 74 |

**MUSEUM OF COMPARATIVE ZOOLOGY**, Cambridge, Massachusetts.

Publications upon Ichthyology and Marine Invertebrates. (56 & 61.)

**NELSON, CHRESTEN**, Gloucester, Massachusetts.

Patent Preservative for Canvas, Manila Rope, and Netting. (5.)
Specimens of Canvas, Rope, and Netting, preserved with the Fluid. (5.)

**NEW BEDFORD CORDAGE COMPANY**, New Bedford, Massachusetts.

Cordage used in the Whale Fishery. (1.)

**ANDERSON, ABBOTT, AND ANDERSON'S**
*Waterproof Riding Aprons & Hunting, Leggings, and Valises.*
**17, Queen Victoria St., London, E.C.**

**NICKERSON & BAXTER**, Boston, Massachusetts.

Samples of Fish-hooks used in Sea Fisheries, manufactured by J. W. Court & Co., Brooklyn, New York. (1.)

These hooks are mostly used in the Cod, Haddock, Hake, Halibut, and Mackerel fisheries, though the latter fishing is now conducted almost entirely with the purse seine. The central draught hooks are the latest pattern, and usually given the preference over the straight shank hook. No. 10 central draught and No. 6281 straight shank are used for large Codfish in hand-line fishing, and Nos. 11, 12, and 13, and 6282–3–4 for smaller fish. No. 14 is a Grand Bank trawl hook, and 15, 16, 17 for Haddock trawls.

**NICHOLS, B. F.**, Boston, Massachusetts.

Hexagonal Split Bamboo Fishing Rods. (14–16.)

FLY RODS.

No. 1. 10 feet long, 3 pieces, weight 7 ounces, 2 tips, Bamboo tip case sack and wood shipping case.

No. 2. 11 feet long, 3 pieces, weight 8 ounces, 2 tips, Bamboo tip case, sack and wood shipping case.

No. 3. 11½ feet long, 3 pieces, weight 9 ounces, 2 tips, Bamboo tip case, sack and wood shipping case.

No. 4. 11½ feet long, 3 pieces, weight 10 ounces, 2 tips, Bamboo tip case, sack and wood shipping case.

No. 5. 12 feet long, 3 pieces, weight 10½ ounces, 2 tips, Bamboo tip case, sack and wood shipping case.

No. 6. 12 feet long, 3 pieces, weight 12½ ounces, 2 tips, Bamboo tip case, sack and wood shipping case.

No. 7. General Rod, 11½ feet long with Fly Tip, weight 10½ ounces; and 9½ feet long, weight 9½ ounces, with short tip (2 feet long), for Bait Fishing or Trolling.

This is a very handy rod, is suitable for Bass or Trout, with the fly tips (of which there are two), and Bait Fishing or Trolling, with the short tip; making the rod in 3 pieces, Bamboo tip case, sack and wood shipping case.

BLACK BASS RODS.

No. 8. 10 feet long, 3 pieces, weight 9½ ounces, ring guides, reel-seat below grasp, 2 tips, Bamboo tip case, sack and wood shipping case.

No. 9. 10 feet long, 3 pieces, weight 10 ounces, standing guides, reel-seat above grasp, 2 tips, Bamboo tip case, sack and wood shipping case.

No. 10. 8½ feet long, 2 pieces, weight 9½ ounces, standing guides, reel-seat above grasp, 2 tips, grooved wood case, sack and wood shipping case.

ANDERSON, ABBOTT, & ANDERSON
Have the Largest and Best selection of Waterproof KNAPSACKS AND HAVERSACKS in London.
Bags and Valises for Bicycling and Tricycling, Lawn Tennis and Travelling.
37, QUEEN VICTORIA STREET, LONDON, E.C.

**ICHOLS, B. F.**—*continued.*

STRIPED BASS RODS.

1 rod, 8 feet long, 2 pieces, weight 19 ounces.
1 rod, 8½ feet long, 2 pieces, weight 20 ounces.
1 rod, 9 feet long, 2 pieces, weight 25 ounces.
1 rod, 8 feet long, 3 pieces, weight 20 ounces.
1 rod, 8½ feet long, 3 pieces, weight 22 ounces.
1 rod, 9 feet long, 3 pieces, weight 25 ounces.

SALMON RODS.

1 rod 16 feet long, 3 pieces, weight 26 ounces.
1 rod 16½ feet long, 3 pieces, weight 27 ounces.
1 rod 17 feet long, 3 pieces, weight 28 ounces.
1 rod 17½ feet long, 3 pieces, weight 30 ounces.
1 rod 18 feet long, 3 pieces, weight 32 ounces.

GRILSE RODS.

1 rod 14 feet long, weight 22 ounces.
1 rod 14½ feet long, weight 23 ounces.
1 rod 15 feet long, weight 24 ounces.

All rods have full German silver reel-plate and mountings, and grooved cases covered with cloth and cloth sacks. All above rods have two tips duplicate.

CALEDONIA FLY RODS.

No. 1. 9 feet 4 inches long, weight 5¼ ounces, 3 pieces, 2 tips.
No. 2. 9 feet 8 inches long, weight 6 ounces, 3 pieces, 2 tips.
Full German silver mountings, grooved cases, &c.

THE TOURIST COMBINATION ROD.

12 feet long, in 4 pieces, weight 13 ounces, with extra butt-joint, and extra reversible grasp and reel-seat (to be used with reel above or below the hand), and extra short tip for trolling or bait fishing, and extra long butt-joint to be used instead of first and second joint, making a 9 feet 7 ounce fly-rod, making in all 8 pieces, and four regular and perfect rods, all in a cloth-covered grooved case 3 feet 3 inches long, all weighing about 4 pounds when packed. It has full German silver mountings.

**LD COLONY MILLS,** Plymouth, Massachusetts.
Samples of Canvas used on fishing-vessels. (5.)

**REGON PACKING COMPANY,** J. W. and V. Coole. Proprietors, Portland, Oregon.
Cooked Preparations in cans. (26.)
Canned Salmon. (One-half dozen cans.)

**SGOOD, N. A.,** Battle Creek, Michigan.
Portable Folding Canvas Boat. (20.)
Length, 12 feet; width, 3 feet; height, 1 foot.
Folding Minnow Crate. (33.)

**STERMOOR, H. D., & SON,** 36, Broadway, New York City.
Life-saving Mattress. (9.)

**ACKARD, PROF. A. S., JUN.,** Providence, Rhode Island.
Publications upon Marine Invertebrates. (61.)

**PAGE, E. W., & CO.**, 69, West Street, New York City.
Exhibit of oars used on fishing and whaling vessels. (6.)

**PALMER, JOSEPH**, U.S. National Museum, Washington. (51 & 54.)
Casts of seal and fish (the entire collection of casts of cetaceans, reptiles, and fishes in the collective exhibit of the United States was made by Mr. Palmer).

**PARKER, JOEL C.**, Grand Rapids, Michigan.
Hatching box with clockwork attachment for supplying motion. (35.)

**PARSONS, WILLIAM B.**, Rockport, Massachusetts.
Ancient fishing apparatus used at Rockport. (1.)
Old Stone Killick. Old Bait Chopper. Old Lantern.

**PERKINS AND SHURTLEFF**, Portland, Maine.
1 box of compressed cod, 10 packages in case, 5 pounds each, with all large bones removed, compressed in rolls of a round shape, and ready for cooking. (26.)

**PHILLIPS, BARNET**, New York City.
Essay on Prehistoric Fish-hooks. (57.)

**PHOTO-ENGRAVING COMPANY**, A. R. Hart, President, 67, Park Place, New York City.
Photo-engravings of Fish from pen drawings.

**PICKERT, L., & CO.**, Boston, Massachusetts.
Dry salted preparations. (26.)
Compressed Codfish, 5-pound paper packages.
Smoked preparations. (26.)
Blackwood's English Boned Herring, in tin.
Blackwood's Mount Desert Boneless Herring, in wood.
Finnan Haddies, 1-pound cans.
Pickle or brine-salted preparations. (26.)
Corned Codfish. Nonpareil Mess Mackerel. Climax Mess Mackerel. Isles of Shoals Mess Mackerel. Diadem Mess Mackerel.
Preparations in spices, vinegar, &c. (26.)
Soused Mackerel. Soused Brook Trout. Broiled Mackerel Mustard Sauce. Broiled Mackerel, Tomato Sauce. Labrador Herring, Tartar Sauce. Hudson Bay Herring, Tomato Sauce. Soused Brook Trout. Fresh Codfish. Fresh Mackerel. Fresh Lobster. Fresh Clams. Clam Chowder. Fried Smelts.
Fishermen's food in cans. (22.)
Baked Beans, 3-pound cans.
New England Boiled Dinner, 3-pound cans.
Samples of brands of boneless fish and canned fish. (26.)

**'ICKING, HENRY F.**, Commander, U.S.N., Naval Secretary, Light House Board, Washington, District of Columbia.
Nickel-plated working model of the Courtenay Automatic Whistling Buoy. (6.)

**'IERCE, CAPT. EBEN**, New Bedford, Massachusetts.
Bomb-lance for killing whales. (1.)

**'IKE, R. G.**, Middletown, Connecticut.
Model of Spiral Fishway, showing the economy of space and material, by spiral arrangement. (37.)

**'ORTLAND PACKING COMPANY**, Portland, Maine.
Cooked preparations in cans. (26.)
Canned Lobsters.
Canned Clams.

**'OTTER & WRIGHTINGTON**, Boston, Massachusetts.
Dry salted preparations. (26.)
Boneless Fish, Lion and Unicorn brand, in paper packages.
Minced Codfish, 1-pound cans.
Smoked preparations. (26.)
Boneless Herring, Lion and Unicorn brand, in cans.
Smoked Salmon, Lion and Unicorn brand, in cans.
Smoked Halibut, Lion and Unicorn brand, in cans.
Pickle or brine-salted preparations. (26.)
Canned salt Mackerel, Lion and Unicorn brand, 5-pound oval cans.
Prize Mess Mackerel, 5-pound oval cans.
Minot's light Mess Mackerel, 4-pound oval cans.
Preparations, in spices, vinegar, &c. (26.)
Fresh Soused Mackerel in Mustard. Spiced Ocean Trout. Soused Herring. Herring in Tomato Sauce. Eels in Jelly. Mackerel in Tomato Sauce. Ocean Trout in Tomato Sauce.
Cooked preparations in cans.
Fresh Mackerel. Fresh Herring. Fresh Ocean Trout. Fresh Clams. Fresh Codfish. Fresh Lobsters. Clam Chowder. Codfish Chowder. Fresh Cod.
Fishermen's food in cans. (22.)
Baked Beans. Roast Beef. Roast Mutton. Roast Turkey, Roast Chicken. Roast Veal. Boiled Dinner.

**ANDERSON, ABBOTT, & ANDERSON,**
MANUFACTURERS OF THE BEST
**OILSKIN CLOTHING FOR SEA AND LAND PURPOSES;**
Also Oilskin Horse Clothing, Cart and Rick Covers, and their Celebrated Patent Waterproof Cloth for Covering, Driving and Carriage Aprons, &c., &c.
(*Copy of Testimonial.*) HOME OFFICE, *Sept.* 3, 1878.
MESSRS. ANDERSON & Co.—You made me an Oilskin Coat about seven years ago, which has stood in capital condition until this year. (Signed) A. F. O. LIDDELL.

**POTTS, EDWARD,** Philadelphia, Pennsylvania.
Collection of Freshwater Sponges, in alcohol, and mounted for microscopic examination. (43.)

**PROCTER BROTHERS,** Gloucester, Massachusetts.
File of "Cape Ann Advertiser." (60.)
Publications relating to the Fisheries. (60.)

**PRYER, JASPER,** 143 Front Street, New York City.
Samples of Fish Oils and their products. (29.)

**PUTNAM, PROF. F. W.,** Cambridge, Massachusetts.
Publications upon Ichthyology. (55.)

**QUINN, JAMES,** Quinnis, Oregon.
Cooked preparations in cans. (26.)
Canned Salmon.

**QUINNIPIAC FERTILIZER COMPANY,** New London, Connecticut.
Samples of Menhaden Guano. (29.)
Dry Fish Scrap.
Dry Ground Fish Guano.
Fish and Potash (ammoniated with fish).
Superphosphate (ammoniated with fish).

**RATHBUN, RICHARD,** United States National Museum, Washington.
Publications upon Aquatic Invertebrates. (61.)

**RAU, DR. CHARLES,** U. S. National Museum, Washington.
Publications on prehistoric fishing. (57.)

**RECHT, C.,** 183 Bowery, New York City.
Foster's transparent Gimp Gut. (14–16.)

**RICARDO, GEORGE,** Hackensack, New Jersey.
Box for hatching eggs of the smelt. (35.)

**RICHARDSON, NATHAN,** Gloucester, Massachusetts.
Richardson Challenge Steerer. (6.) Steering-wheel, patented May 30, 1882.

**RIDGWAY REFRIGERATOR COMPANY (LIMITED),** Philadelphia, Pennsylvania.
Model of Refrigerator. (33.)

ANDERSON, ABBOTT, & ANDERSON'S
**CAPE VENTILATING WATERPROOFS**
ARE UNEQUALLED.
37, Queen Victoria Street, London, E.C.

**RIDGWAY, ROBERT,** U. S. National Museum, Washington.
Publications upon aquatic and fishing birds. (53.)

**RILEY, PROF. C. V.,** Department of Agriculture, Washington.
Types of insects useful and injurious to fish and fishermen. (49.)

**ROBINSON, WM. S., & CO.,** New Haven, Connecticut.
Exhibit of tubs and kegs for packing oysters and fish. (33.)

**ROSENSTEIN BROTHERS,** 323 Greenwich Street, New York City.
Preparations in spices, vinegar, &c. (26.)
Spiced Sardines, Royal brand. Mustard Sardines. Mustard Sardines.
Preparations in oil. (26.)
Oil Sardines, Debois brand. Oil Sardines, Louis Phillipe brand. Oil Sardines, Alfred Elienne brand.
Cooked preparations in cans. (26.)
Canned Lobsters, Royal brand, Eastport Packing Company.

**RUSSELL, ALBERT & SONS,** Newburyport, Massachusetts.
Pump for use on fishing vessels. (6.)

**RUSSELL MILLS COMPANY,** Plymouth, Massachusetts, N. Boynton & Co., Agents, Boston, Massachusetts.
Samples of sail canvas. (5.)

**RUSSIA CEMENT COMPANY,** Gloucester, Massachusetts. Theodor Eckhardt, General Agent, 32 Aldermanbury, London, E.C., and 38 Neue Friedrichstrasse, Berlin.
Exhibit of glue made from fish skins and materials used in its manufacture; also articles in the preparation of which fish-glue is used. (29.)

**RYDER, JOHN A.,** U. S. Fish Commission, Washington.
Publications upon the embryology of fishes and microscopic sections and photographs illustrative of the same. (36 & 55.)

**SCAMMON, CHARLES M., CAPTAIN,** U. S. Revenue Marine.
One volume on Marine Mammals, together with account of the American whale-fishery. (60.)

**SCHMIDT, S., & BRO.,** New York City.
Smoked preparations. (26.)
Smoked Eels; Smoked Salmon; Smoked Sturgeon; Smoked Smelts; Smoked Herring; Brat Herring.
Pickle or brine salted preparations. (27.)
Caviare (Sturgeon roe).
Isinglass from Sturgeon. (27.)

**SCRIBNER'S SONS, CHARLES,** New York City.
Game Fishes of the United States. (55, 57, 61.)
A series of twenty magnificent paintings of fishes and scenery, by S. A. Kilbourne, with text by G. Brown

**SCRIBNER'S SONS, CHARLES**—*continued.*

Goode, assistant director United States National Museum, and assistant in the United States Fish Commission; 10 parts in wrappers, not stitched, large folio, 1879–1881.

Also a map, showing by means of coloured lines the geographical distribution of the game fishes of Eastern North America, compiled from sketches by G. Brown Goode; and many engravings.

**SEA WORLD PUBLISHING COMPANY, W. B. Hopson,** manager and editor, Baltimore, Maryland.

File of "The Sea World and Packer's Journal." (60.)

**SELLMAN, HENRY,** Camden, Maine. (Union Fish Company.)

Model of Sardine Factory. (25.)

**SEWELL, DAY & CO.,** Boston, Massachusetts.

Samples of Cordage used on fishing vessels. (5.)

**SHAW, B. F.,** Anamosa, Iowa.

Model of step and pool Fishway in spiral arrangement. (67.)

**SHINDLER, A. ZENO,** U. S. National Museum, Washington.

Paintings of tortoise, snake, and fish from plaster casts. Three specimens. (The entire collection of reptiles and fishes in the collective exhibit of the United States was painted by Mr. Shindler.)

**SHIPLEY, A. B., & SONS,** Philadelphia, Pennsylvania.

Fishing-rods. (14–16.)

Six-strip split Bamboo rod, $20.
Six-strip split Bamboo rod, $30.
Split Bamboo rod and reel in case.
Bethabara wood, 10-foot pole, $16.50.
Bethabara wood, pole 5½ ounces, $10.50.
Bethabara wood, 12-foot pole, $16.50.

Fishing-reels. (14–16.)

70-yard Balance sliding slick reel.
250-yard Fairmount click reel.
300-yard Balance handle, steel pivots, &c.

Waterproof fly-line. (14–16.)

Brails, snoods, cat-fish nippers, and other articles used by anglers. (14–17.)

**SIEWERD, F. H., & BROTHER,** Baltimore, Maryland.

Cooked preparations in cans. (26.)

Canned Oysters, Cove brand.

**SIGSBEE, COMMANDER CHARLES D., U. S. Navy,** Washington.

Apparatus employed in deep-sea research in the work of the United States Coast Survey. (40.)

**SMILEY, C. W.**, United States Fish Commission, Washington.
Publications relating to fish and fishermen. (60.)

**SIMMS, JAMES M.**, Gloucester, Massachusetts.
Gang of standing rigging for fishing schooners. (5.)

**SMILLIE, T. W.**, Photographer, U. S. National Museum, Washington.
One screen of photographs of fishes and illustrative of the fisheries. (51.) (The entire collection of photographs in the collective exhibit of the United States was made by Mr. Smillie.)

**SMITH, EVERETT**, Portland, Maine.
Model of inclined plane return fish-way. (37.)

**SMITHSONIAN INSTITUTION**, Washington. Spencer F. Baird, Secretary.
Publications relating to the Natural History of the waters. (53–61.)

**SOLUBLE PACIFIC GUANO COMPANY**, Wood's Holl, Massachusetts.
Series of preparations illustrating the manufacture of Soluble Pacific Guano. (29.)
Crude Menhaden Scrap; Dried and Ground Menhaden Scrap; Muriate of Potash; Nitrate of Soda; Crude South Carolina Phosphate; Crushed South Carolina Phosphate; Ground South Carolina Phosphate; Sicily Sulphur; Stassfurth Kainite; Soluble Pacific Guano, unscreened; Soluble Pacific Guano, screened.

**STANLEY, HENRY O.**, Dixfield, Maine.
Pencil sketch on birch-bark of a Rangeley Trout caught by Mr. Stanley, October 10, 1877; weight 9½ lbs. (57.)

**STEARNS, SILAS**, Pensacola, Florida.
Works on fisheries. (60.)

**STILLWELL, E. M.**, Bangor, Maine.
Can for transportation of young fish, and pump for aerating the water. (35.)
Painting on birch-bark of Grand Lake Stream Trout. (51.)

**STINEMETZ, B. H.**, 1237 Pennsylvania Avenue, Washington.
Collective display of skins of beaver, otter, musk, and musquats, raw, plucked, and dressed. (32.)

ANDERSON, ABBOTT, & ANDERSON'S
**FISHING STOCKINGS AND BROGUES**
[VERY LIGHT.] **ALL IN ONE.** [VERY STRONG.
37, Queen Victoria Street, London, E.C.

**STONE, LIVINGSTON,** Charlestown, New Hampshire.
Series of eggs and young of the California Salmon, sho
the daily growth from the newly-impregnated egg t
young fish several weeks old. (16.)
Apparatus used in hatching eggs of the various speci
Salmonidæ; also box for rearing young Salmon. (16.)

**SWAN, JAMES G.,** Port Townsend, Washington Territory
Publications relating to the Indian fisheries of the North-
coast.
(Most of the fishery collection from the North-west
in the fisheries exhibit was obtained through Mr. Sw

**TANNER, LIEUT. Z. L.,** U.S.N., U.S. Steamer "Albatr
Deep-sea Sounding Machine. (40.)

**TARR, JAMES H.,** Gloucester, Massachusetts.
Cape Ann Copper Paint; used on bottoms of fishing vessels.

**TARR & WONSON,** Gloucester, Massachusetts.
Patent Copper Paint, used on bottoms of fishing vessels.

**TAYLOR, THOMAS,** New Berne, North Carolina.
Can for the transportation of fish ova. (35.)

**TAYLOR, WILLIAM,** Portland, Maine.
Improved sword-fish lily ison. (1.)

**THAXTER & SON, S.,** Boston, Massachusetts.
Exhibit of Eldridge's Charts and Coast Pilot. (6.)

**THE GEORGE W. MILES COMPANY,** Milford, C
necticut.
Samples of Menhaden; Menhaden Oil and Guano. (29.)

**TIFFANY & CO.,** New York City and Paris.
Exhibit of articles made of Alligator Skin. (32.)
Travelling-bags in great variety, and filled with article
ladies and gentlemen.
Steamer bags, tourists' bags, railroad bags, pic-nic b
dress-suit bags, hand bags, shopping bags, brief bags,
bags for ladies, card cases, letter cases, porte-monna
pocket-books, bill books, visiting books and cases, blot
railroad ticket cases, prescription books, memoran
books, nail-set cases, dressing-cases, scissor cases,
brush cases, cigarette cases, cigar cases, photograph
(pocket), razor cases, note cases, jewelry cases, comb
work cases, writing cases, postage-stamp cases,
boxes, jewel boxes, handkerchief boxes, glove boxes, m
boxes, photograph frames, photograph screens,
pouches, eye-glass pouches, papeteries, music rolls, sh
straps, inkstands, belts for ladies, dog collars, port
mirrors, paper racks, gentlemen's key-belts.

**TODD, H. L.**, draughtsman, U. S. Fish Commission, Washington.
Drawing of fishes for photo-engraving process. (51.)

**TOWER, A. J.**, Boston, Massachusetts.
Oiled clothing worn by fishermen. (21.)

*a. Double goods, yellow. Fish brand.*

1. Officers' Long Coat, with inside sleeve, leather buttonholes, patched elbow, epaulet on shoulder, &c. 2. Long Coat. Patched elbows, inside sleeves, and epaulets. 3. Jacket. 4. Fishermen's Apron Pants. 5. Seaman's String Pants. 6. Frock or Half Coat. 7. Petticoat Barvell. 8. Barvell or Apron. 9. Sleeves.

*b. Double goods, black. Fish brand.*

10. Long Coat. 11. Jacket. 12. Fishermen's Apron Pants. 13. String Pants. 14. Petticoat Barvell. 15. Common Barvell. 16. Sleeves.

*c. Oiled Hats.*

17. "Cape Ann" or Sou'wester. 18. Soft yellow. 19. Soft black. 20. Yellow and black Squam. 21. Miners' (with leather).

**UNITED STATES ALBUMEN MANUFACTURING COMPANY**, Osterville, Massachusetts. Uno. H. Hillman, Superintendent.
Albumen made from fish ova. (27.)

**UNITED STATES BEACON LIGHT AND SIGNAL COMPANY.** J. M. Foster, President, Philadelphia, Pennsylvania.
Exhibit of beacons and signals. (6.)

**UNITED STATES CENSUS OFFICE; TENTH CENSUS OF THE UNITED STATES.** C. W. Seaton, Superintendent, Washington.
Statistics relating to the fisheries. (60.)
Reports and maps illustrating the condition of the United States in 1880.

**UNITED STATES PATENT OFFICE.** Hon. Edgar M. Marble, Commissioner.
List of patents relating to the fisheries complete to 1883. (60.)

**ANDERSON, ABBOTT, & ANDERSON,**
MANUFACTURERS OF EVERY DESCRIPTION OF
**INDIA-RUBBER**
For Mechanical, Scientific, and Domestic purposes; also Manufacturers of Leather and Canvas Hose, Leather, India-Rubber, and their Patent Cerofilum Belting, Sheet Rubber, Tubing, &c.

**UNITED STATES NATIONAL MUSEUM,** Spencer F. Baird, Director, Washington.

Proceedings and bulletins containing numerous papers relating to the natural history of fish and other aquatic animals. (60.)

The collections of the National Museum have been extensively drawn upon in the preparation of the collective exhibit of the United States, in accordance with the provisions of the law authorizing the participation of the United States in this Exhibition.

**U.S. BUREAU OF NAVIGATION—HYDROGRAPHIC OFFICE.** Com. J. C. P. de Krafft, Hydrographer.

Charts of the Atlantic and Pacific coasts of North America. (6.)

**U.S. NAUTICAL ALMANAC OFFICE,** Washington. Simon Newcomb, Supt.

Nautical Almanacs. (6.)
American Ephemeris. (6.)

**U.S. BUREAU OF STATISTICS** Washington. Joseph Nimmo, Jun., Supt.

Statistics of tonnage and exports and imports.

**UNITED STATES LIFE-SAVING SERVICE,** Sumner I. Kimball, Superintendent.

Exhibit of apparatus and publications used by the service. (9.)

A.—Life Boats.

I. New Jersey Lifeboat for sandy beaches.
II. The Long Island Lifeboat for sandy beaches.
III. Massachusetts Lifeboat for rocky and shingly beaches.
IV. The Dobbins Lifeboat, self-righting, self-bailing, and self-ballasting, used at stations adjacent to harbours where there is a sheltered place for landing.

B.—The American Life Car, about 12 ft. long. Will transport from a wreck to the shore at each trip six people, protecting them from exposure to the weather.

C.—Beach Apparatus Cart. Used at all stations of the Life-Saving Service, and loaded with all apparatus for making connections from shore to wreck, including gun, hawser, whips, breeches buoy, and shot-line.

The gear used with the apparatus cart is serviceable with either breeches buoy or life-car.

D.—Life-Saving Apparatus.

I. Merryman's Rubber Suit.
II. Life-Preserving Apparatus.

E.—Old and new types of beach ordnance used in making connections with wrecks.*

F.—The illustrations of the patrol system, including patrol checks and other outfits.

* This gun was the first ever fired in the American Life-Saving Service, and was instrumental in saving 251 lives from the English ship "Ayreshire."

**ITED STATES LIFE-SAVING SERVICE**—*continued.*

G.—Shot lines and other cordage used in the service.

H.—Drawings and specifications of Life Boat Stations at various points on the coasts of the Atlantic, Pacific, and Great Lakes.*

I.—Medicine chest and other appliances for resuscitating the wrecked.

K.—Papers and documents used in the service or explanatory of its work.

L.—A collection of paintings, illustrating the operations of the service; exhibited by the Century Company of New York City.

**ITED STATES COAST AND GEODETIC SURVEY,** Washington. J. E. Hilgard, Superintendent.

Collection of about one hundred and twelve charts published by the Survey, being charts of the Atlantic and Pacific coasts of North America. (6).

Divisions, A, B, and 14 of the Atlantic Coast Pilot. (6.)

Apparatus for the scientific investigation of the waters—densimeter and salinometer—invented by Professor J. E. Hilgard. (40.)

**S. LIGHT-HOUSE BOARD,** Vice-Admiral, S. C. Rowan, J.S.N., Chairman, Washington.

Map showing the positions of the Life Saving and Light Stations of the United States. (7.)

Charts of the following Light-House Districts: First, second, third (including Lake Champlain), fourth, fifth, sixth, seventh, eighth, eleventh, twelfth, and thirteenth.

Reports of the Light-House Board for the years 1872, 1873, 1874, 1875, 1876, 1877, 1878, 1879, 1880, 1881, and 1882.

Drawings and Specifications for Light-Houses, Beacons, Buoys, Light-Vessels, and Light-House and Buoy Tenders. 6 vols.

Pictures of Light-Houses, Tenders, Light-Vessels, &c.:

First-order Light-House on Thatcher's Island, Cape Ann, sea coast of Massachusetts. (Photo.)

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The location of these stations is marked with green circles on the large furnished by the Treasury Department.

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**IDERSON, ABBOTT, & ANDERSON'S**
**INDIA-RUBBER**
**OT-WATER BOTTLES.**
**No Household should be without them.**
, QUEEN VICTORIA ST., LONDON, E.C.

**U.S. LIGHT-HOUSE BOARD**—*continued.*

Second-order Light-House on Minot's Ledge, sea coast of Massachusetts. (Oil painting.)

Fourth-order Light-House on Southwest Ledge, Long Island Sound, Connecticut. (Water colour.)

Day or Unlighted Beacon on Sea Flower Reef, Long Island Sound, Connecticut.

Screw-pile Light-House at Cedar Point, Potomac River, Virginia. (Photo.)

Screw-pile Light-House on Thimble Shoal, Hampton Roads, Virginia. (Indian ink.)

First-order Light-House on Cape Henry, entrance to Chesapeake Bay, Virginia. (Water colour.)

Second-order Light-House on Hunting Island, sea coast of South Carolina, entrance to Saint Helena Sound. (Photo.)

Rear Beacon of Paris Island Range. Guide into Port Royal Sound, South Carolina. (Water colour).

First-order Light-House at Saint Augustine, sea coast of Florida. (Photo.)

First-order Light-House on Fowey Rocks, sea coast of Florida. (Water colour.)

Fourth order Light-House at entrance to Calcasieu River, Gulf coast of Louisiana. (Photo.)

Western River Stake Light. (Water colour.)

Third-order Light-House at Cleveland, Ohio. (Water colour.)

Second-order Light-House at Grosse Pointe, Illinois. (Photo.)

Second-order Light-House on Stannard's Rock, Lake Superior, Michigan. (Water colour.)

First-order Light-House at Piedras Blancas, sea coast of California. (Indian ink.)

First-order Light-House at Pigeon Point, sea coast of California. (2 photos)

Fourth-order Light-House on Mare Island, entrance to Straits of Karquines, California. (Indian ink and Sepia.)

First-order Light-House at Point Reyes, sea coast of California. (Photo.)

First-class Light Vessel with Steam Fog Whistle. (Photo.)

Light-House Tender "Dahlia." (Indian ink.)

Light-House Tender "Manzitana." (Water colour.)

ARMY REGULATION

WATERPROOF.

ANDERSON, ABBOTT, AND ANDERSON'S

WATERPROOF.

GROUND SHEETS.

. **LIGHT-HOUSE BOARD**—*continued.*

Models:

Second-order Light-House on Minot's Ledge, sea coast of Massachusetts.

Light Vessel No. 40 on Five Fathom Bank, entrance to Delaware Bay.

First-order Light-House on Fowey Rocks, sea coast of Florida. Scale $\frac{3}{4}$ inch to 1 foot.

Specimen of Coral from Fowey Rocks, Florida.

First-order Light-House on Sand Key (near Key West), Florida. Scale, $\frac{1}{2}$ to 1 foot.

Second-order Light-House on Spectacle Reef, Lake Huron, Michigan.

Crib used in the construction of Spectacle Reef Light-House.

Coffer Dam used in preparing the reef and laying the lower courses of Spectacle Reef Light-House.

Builder's model of Light-Vessel.

Courtenay Automatic Whistling Buoy.

**ITED STATES ARMY SIGNAL SERVICE.** W. B. lazen, Brigadier and Brevet Major-General, Chief Signal )fficer, U.S.A.

Instruments used in the meteorological service and the system of weather forecasts and storm signals. (6.)

.ist of instruments:

2 barometers, 2 maximum thermometers, 2 minimum thermometers, 3 exposed thermometers, with supports and cup, muslin and wicking for wet bulb, 2 water thermometers, 1 water thermometer case with cord, 2 anemometers, one for interior and one for exterior, 1 self-register, double, 1 barometer, self-registering, Eccard's (transmitter and recorder), 1 wind vane, large, with attachment complete (one used at Paris), 3 rain-gauges — one copper, one galvanized iron, and one small size, 1 signal service telescope, 1 signal service telescope holder, 1 signal service marine glass, 2 call boxes, 2 phones and 2 transmitters, Eccard's, 1 anemometer Post, $4\frac{1}{2}$ feet high, 1 signal lantern, red, large, 1 signal lantern, white, large, 100 feet cautionary signal halyards, 1 cautionary signal indicator, 1 wreck knapsack, 1 A tent, 1 folding table, 2 folding chairs, 2 box sounders, 2 pliers, pairs, 1 dash lantern, 1 cable box for coast line, 1 testing box-line, 1 tool box, Signal Service, 1 banner, silk, embroidered, Signal Service, U. S. A., 1 set of flags, international, 1 set of flags, life-saving, 2 flags, 8 feet, red cautionary, 2 flags, 6 feet, red, cautionary, 2 flags, 8 feet, white, cautionary, 2 flags, 6 feet, white, cautionary, 2 signal kits, complete, with 2-feet flags, 1 circuit map, framed, 1 map, showing cautionary display stations, framed, 1 map, enlarged, sea-coast line,

**UNITED STATES ARMY SIGNAL SERVICE**—*continued.*

framed, 1 map, large, weather, 1 set Annual Reports, C. S. O., bound, 1 set International Bulletins, bound, 1 set Monthly Weather Reviews, bound, 1 set Daily Bulletins, &c., bound, 1 set tri-daily weather maps, bound, large, 1 set Professional Papers, 1 set Signal Service Notes, 6 cipher books, 6 sets cipher cards, 6 Instructions to Observers, 12 Instructions to Voluntary Observers, 1 Signal Service Manual, 6 Manuals, Military Telegraph, latest edition, and Instructions for constructing Military Telegraph Lines, 1 Army Regulations, 1 set telescope blanks (filled out) for transmitting cau. sig. orders, showing method of ordering signals *up* or *down*, with explanatory messages, giving character of storm.

Manifold forms and carbon paper—

1 set of manifold forms, 107, filled out.
1 set of manifold Press Reports, filled out.
1 set of manifold River Bulletins, filled out.

**VAN ALTENA & SHELTUS**, Milwaukee, Wisconsin.

Samples of "The Connecting Sinker or Fish-hook Holder." (14–16.)

**VERRILL, PROFESSOR A. E.**, Yale College, New Haven, Connecticut.

Publications upon marine invertebrates and deep-sea research. (61.)

**VOSS, ADOLPH**, Gloucester, Massachusetts.

Bait Mill. (6.)
Boom-crotch Supporter. (6.)
(See Collective exhibit).

**VOSS, O. C.**, Gloucester, Massachusetts.

Snug-stow anchor. (6.)

**WHITE, DR. C. A.**, U.S. Geological Survey, Washington.

Monograph of the land and fresh-water fossil molluscs of North America, containing essay upon the evolution of fresh-water molluscs and fishes from marine forms. (56.)

**WILCOX, W. A.**, Secretary Boston Fish Bureau, Boston, Massachusetts.

Exhibits showing methods of reporting the statistics of the fish markets of New England. (60.)
Reports of the Boston Fish Bureau. (60.)

These reports are issued daily (during the busy fishing season several times a day); also, weekly, monthly, and annually. They contain receipts of all fish arriving in Boston, both foreign, domestic, and from fishing vessels. Receipts of fish at all the leading out-ports are daily reported; movements of the fish and fishing fleets, from day to day; success and prospects of the catch; market quotations of sales are daily reported by telegraph from all important localities, with reports from agents and correspondents at all leading

**ILCOX, W. A.**—*continued.*

ports in the United States and British Provinces of all matters of interest in connection with the fishing industry; also, weekly statistics and comparisons of receipts, catch, prices, &c., with former years.—W. A. WILCOX.

**ILCOX, CRITTENDEN & CO.**, Middletown, Connecticut.
Boat and vessel fittings, old and new styles, in great variety. (6.)

**ILLETS, JOSEPH**, Skaneateles, New York.
Angler's Rack for carrying blankets, guns, &c. (19.)
Angler's Home-made creel. (19.)

**ING, J. & W. R.**, New Bedford, Massachusetts.
Slab of baleen or whalebone from Bowhead whale, *Balæna mysticetus*, taken in Pacific Arctic Ocean by bark "Fleetwing," in May, 1882. (32.)

**INSLOW, LIEUT. FRANCIS**, U.S. Navy, Washington.
Publication, charts, and photographs illustrating the natural history of the oyster and the oyster-culture. (35 and 61.)

**OLFF AND RIESING**, Eastport, Maine.
Preparations in oil. (26.)
Oil sardines.
Preparations in spices, vinegar, &c. (26.)
Mustard sardines.
Marinée sardines.

**OLTZ, GEORGE**, Washington.
Model of Potomac shad-lighter. (4.)

**ONSON, EVERETT P.**, Gloucester, Massachusetts.
Exhibit of stuffed fishes, prepared by Davidson's method of ichthytaxidermy. (51.)

**OOD, REUBEN**, Syracuse, New York.
The Reuben Wood Trout-fly. (15.)
The Reuben Wood Bass-fly. (15.)

**OOD, LIEUT.**, U.S. Navy, U.S. steamer "Fish Hawk."
Self-detaching apparatus for lowering small boats. (9.)

**OODBURY MILLS**, Baltimore, Maryland.
Samples of canvas used on fishing vessels. (5.)

**ORREL, JAMES**, Columbia, Pennsylvania.
Model of sluice fish-way. (37.)

WATERPROOFS FOR BOYS,
In Tweed, Paramatta, and other Materials.
WATERPROOF LEGGINGS & SCHOOL SATCHELS.
ANDERSON, ABBOTT, & ANDERSON,
37, Queen Victoria St., London, E.C.

**WRIGHT, ISAAC H.**, Baltimore, Maryland.
Submerged hatching box, with float for suspending it at any depth below the surface. (35.)

**WROTEN, WILLIAM G.**, Maryland.
Bucket for transporting and hatching fish ova. (35.)

**WYETH, JOHN, & BROTHER**, Philadelphia, Pennsylvania.
Fluid Extract Sea-Wrack or Bladder wrack, *Fucus vesiculosus*; used for reducing morbid obesity or excessive fatness. (32.)

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## CONCORDANCE TO THE OFFICIAL CLASSIFICATION,

FOR THE USE OF THE JURIES.

In the collective exhibit of the United States are included many articles which are labelled with the names of the persons from whom they were obtained, these are not, as a rule, entered for competition.

In the following list are included the names of all exhibitors who will be permitted to receive awards or special mention from the juries.

The artists and preparators by whom the pictures, photographs, casts, stuffed specimens, lay models, &c., have been prepared, may be classed as exhibitors. A list of their names is given at the beginning of the special catalogue of this collection.

### CLASS I.—SECTION I.

### FISHING.

[SEA FISHING.]

DIVISION I.

**Gear of every description and of all nations used in trawl, herring, long line, hand line, and every other mode or system of fishing, including all nets, lines, hooks, harpoons, tackle, &c., employed in the same.**

United States Commission of Fish and Fisheries. Collective Exhibit.

Groups 47, 48, 50, 51, 52, 53, 59, 60, 61, 62, 63, 64, 67, 68, 69, 70, 72, 73, 74, 75, 78, 80, 81, 82, 83, 115, 116, 117, 118, 120, 121.

**ALLEN, F. S.**, New Bedford, Massachusetts.

**BRAND, JAMES A.**, New Bedford, Massachusetts.

**BROWN, JAMES TEMPLE**, United States National Museum, Washington.

**COLE, LUTHER**, New Bedford, Massachusetts.

**COLLINS, PAUL E.**, Boston, Massachusetts. (Pictures.)

**EGGERS, S.**, New Bedford, Massachusetts.

***MASON*, H. W.**, New Bedford, Massachusetts.

**MERCHANT, GEORGE, JUN.**, Gloucester, Massachusetts.

**NEW BEDFORD CORDAGE COMPANY**, New Bedford, Massachusetts.

**NICKERSON & BAXTER**, Boston, Massachusetts.

**PARSONS, CAPT. WILLIAM B.**, Rockport, Massachusetts.

**PIERCE, CAPTAIN EBEN**, New Bedford, Massachusetts.

**TAYLOR, WILLIAM**, Portland, Maine.

DIVISION II.

**Oyster dredges, crab, lobster, prawn, &c., pots, and other appliances for catching fish of this description.**

United States Commission of Fish and Fisheries. Collective Exhibit.

Groups 49, 71, 73, 74, 75, 76, 83.

**HAYWOOD, WILLIAM P.**, West Creek, Ocean County, New York.

DIVISION III.

**Fishing craft of all nations; models and representations of the same.**

(i.) Steam fishing vessels and steam carriers.

United States Commission of Fish and Fisheries. Collective Exhibit.

Groups 84, 87, 156, 157.

DIVISION IV.

(ii.) Fishing vessels and boats other than steam vessels.

United States Commission of Fish and Fisheries. Collective Exhibit.

Groups 84, 85, 86, 87, 88, 98, 114.

**BARTLETT, I. H., & SONS**, New Bedford, Massachusetts.

**COLLINS, J. W.**, Gloucester, Massachusetts.

**COOLY, H. & L.**, Provincetown, Massachusetts.

**IRVING, THOMAS A.**, Gloucester, Massachusetts.

**WOLTZ, GEORGE**, Washington.

DIVISION V.

**Ropes and canvas suitable to fishing vessels.**

United States Commission of Fish and Fisheries. Collective Exhibit.

Groups 89, 90.

**DONNELL, J. T., & CO.**, Bath, Maine.

**NELSEN, CHRESTEN**, Gloucester, Massachusetts.

**OLD COLONY MILLS**, Plymouth, Massachusetts.

**RUSSELL MILLS COMPANY**, Plymouth, Massachusetts.

**SEWELL, DAY & CO.**, Boston, Massachusetts.

**SIMMS, JAMES M.**, Gloucester, Massachusetts.

**WOODBURY MILLS**, Baltimore, Maryland.

DIVISION VI.

**Steam capstans, compasses, barometers, telescopes, lights, lamps, fog horns, systems of signalling at night for fishing fleets and vessels, electric lights, luminous paint, and other equipment of fishing vessels, charts for fishermen.**

United States Commission of Fish and Fisheries. Collective Exhibit.

Groups 42, 43, 91, 92, 93, 94, 95, 96, 97, 99.

**UNITED STATES NAVY, HYDROGRAPHIC OFFICE.**

**UNITED STATES NAVY, NAUTICAL ALMANAC OFFICE.**

**UNITED STATES TREASURY, LIGHT-HOUSE BOARD.**

**UNITED STATES COAST AND GEODETIC SURVEY.**

**ADAMS, MAYHEW**, Chilmark, Massachusetts.

**AMERICAN SHIP WINDLASS COMPANY**, Providence, Rhode Island.

**ATWOOD BROS.**, Clayton, New York.

**BAGNALL & LOUD**, Boston, Massachusetts.

**BLISS, JOHN, & CO.**, New York City.

**CAPE ANN ANCHOR WORKS**, Gloucester, Massachusetts.

**CARPENTER, CHARLES**, Kelley's Island, Ohio.

**CLARK, JAMES B.**, Chester, Connecticut.

**COLLINS, JOSEPH W.**, Gloucester, Massachusetts.

**DAVIS & CO.**, Gloucester, Massachusetts.

**JOSEPH, DAVIS, & CO.**, Cincinnati and London.

ANDERSON, ABBOTT, & ANDERSON,
SOLE MANUFACTURERS OF THE CELEBRATED
LEVE ANTIPLUVIUM WATERPROOF GARMENTS,
SUITED FOR ALL CLIMATES
For Gent's Fishing Waterproof Coats and Leggings, being the lightest fabric manufactured in the World.

**PAGE, E. W., & CO.**, New York City.

**PICKING, COMMANDER HENRY T.**, United States Navy.

**RICHARDSON, NATHAN**, Gloucester, Massachusetts.

**RUSSELL, ALBERT, & SONS**, Newburyport, Massachusetts.

**TARR, JAMES H.**, Gloucester, Massachusetts.

**TARR & WONSON**, Gloucester, Massachusetts.

**THAXTER, S., & SONS**, Boston, Massachusetts.

**UNITED STATES BEACON LIGHT AND SIGNAL COMPANY**, Philadelphia.

**VOSS, ADOLF**, Gloucester, Massachusetts.

**VOSS, O. C.**, Gloucester, Massachusetts.

**WILCOX, CRITTENDEN & CO.**, Middletown, Connecticut.

**WOOD, LIEUTENANT**, United States Navy, U.S. Steamer, "Fish Hawk."

DIVISION VII.

**Models of harbours, piers, and slips for fishing purposes.**

United States Commission of Fish and Fisheries. Collective Exhibit.

Groups 77, 112, 124.

**HIGGINS & GIFFORD**, Gloucester, Massachusetts.

DIVISION VIII.

**Fishing tackle and netting in different stages of preparation, and machinery used for working up the raw material.**

United States Commission of Fish and Fisheries. Collective Exhibit.

Group 67.

**AMERICAN NET AND TWINE COMPANY.**

**LORD, H. & G. W.**, Boston, Massachusetts.

**HOOPER, WILLIAM J., SONS** (Baltimore Twine and Net Company), Baltimore, Maryland.

DIVISION IX.

**Life-boats, their equipment, and life-saving apparatus of every description.**

United States Commission of Fish and Fisheries. Collective Exhibit.

Groups, 86, 97.

**ALLEN, FREDERICK S.**, Cuttyhunk, Massachusetts.

**CENTURY COMPANY,** New York City.
**DOBBINS, D. P.,** Buffalo, New York.
**HIGGINS & GIFFORD,** Gloucester, Massachusetts.
**HOLMES, MARSHALL H.,** Philadelphia, Pennsylvania.
**LYLE, LIEUT. D. A.,** U.S. Army.
**MASSACHUSETTS HUMANE SOCIETY,** Boston.
**McLELLAN, LIEUT. C. H.,** U.S. Revenue Marine.
**MILLER BERTH AND LIFE-SAVING MATTRESS COMPANY, THE,** Boston, Massachusetts.
**OSTERMOOR, H. D., & SON,** New York City.
**U.S. ARMY SIGNAL SERVICE.**
**U.S. TREASURY LIFE-SAVING SERVICE.**
**WOOD, LIEUT.,** U.S.N., Washington.

DIVISION X.

**Appliances and methods for breaking the force of the sea at the entrance of harbours and elsewhere.**

United States Fish Commission Photography.

DIVISION XI.

**Methods of communication from the shore to Light-Ships and Fishing Fleets by submarine cables.**

(No display.)

DIVISION XII.

**Methods of protecting submarine cables from injury by fishing operations. (Illustrated by models and drawings.)**

(No display.)

SECTION II.

FRESH-WATER FISHING.

DIVISION XIII.

**Salmon nets and fixed appliances for catching salmonidæ in all their varieties.**

United States Commission of Fish and Fisheries. Collective Exhibit.

Groups 49, 67, 68, 69, 70, 72.

## Division XIV.

**almon rods, reels, lines, artificial flies and baits, gaffs, spears, creels, &c.**

(*See* Division XVI.)

## Division XV.

**'rout rods, reels, landing nets, lines, artificial flies, baits, baskets, bags, &c.**

(*See* Division XVI.)

## Division XVI.

**'ike, barbel, and other coarse fish-rods, reels, and tackle, artificial spinning baits, &c.**

United States Commission of Fish and Fisheries. Collective Exhibit.

Groups 47, 48, 52, 53, 54, 55, 58, 59, 61, 62, 65, 66, 80.

**OMSTOCK, HARRY,** Fulton, New York.
**ONROY & BISSETT,** New York City.
**ILL, L. S., & CO.,** Grand Rapids, Michigan.
**OLBERTON, WAKEMAN,** New York City.
**OOMIS, PLUMB & CO.,** Syracuse, New York.
**ANN, JOHN, & CO.,** Syracuse, New York.
**ILAM, B. C.,** Frankfort, Kentucky.
**ILLS, WILLIAM, & SON,** New York City.
**ICHOLS, B. F.,** Boston, Massachusetts.
**ECHT, C.,** New York City.
**HIPLEY, A. B., & SONS,** Philadelphia.
**WAN, JAMES G.,** Port Townsend, Oregon.
**LTENA & SCHELTUS, VAN,** Milwaukee, Wisconsin.
**WOOD, REUBEN,** Syracuse, New York.

## Division XVII.

**Traps, nets, bucks, wheels, and all kinds of apparatus for catching eels, lampreys, &c.**

United States Commission of Fish and Fisheries. Collective Exhibit.

Groups 48, 57, 70, 73, 75, 76.

DIVISION XVIII.

**Hooks, &c.**

United States Commission of Fish and Fisheries. Collective Exhibit.

Groups 50, 51, 52, 53, 54, 57.

**GREEN, MONROE A.**, Rochester, New York.

DIVISION XIX.

**Anglers' apparel of every description.**

United States Commission of Fish and Fisheries. Collective Exhibit.

Groups 103, 107.

**FERGUSON, ALBERT**, New York City.

**WILLETT, JOSEPH C.**, Skaneateles, New York.

DIVISION XX.

**Boats, punts, cobles, collapsible, portable, &c., in models or otherwise.**

United States Commission of Fish and Fisheries. Collective Exhibit.

Groups, 86, 87, 88, 98.

**EVERSON, JAMES L.**, Williamsburg, New York.

**HOLMES, FRANK**, Chagrin Falls, Ohio.

**OSGOOD, W. A.**, Battle Creek, Michigan.

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CLASS II.

ECONOMIC CONDITION OF FISHERMEN.

DIVISION XXI.

**Apparel and personal equipment.**

United States Commission of Fish and Fisheries. Collective Exhibit.

Groups 100, 101, 102, 109, 110.

**MERCHANT, GEORGE, JUN.**, Gloucester, Massachusetts.

**TOWER, A. J., & CO.**, Boston, Massachusetts.

DIVISION XXII.

**Food and medicine.**

United States Commission of Fish and Fisheries. Collective Exhibit.

Groups 104, 105.

**BUTTRICK, J. T.**, New Bedford, Massachusetts.

**LEWIS, W. K., & BROTHERS**, Boston, Massachusetts.
**MAYO, HENRY, & CO.**, Boston, Massachusetts.
**PICKERT, L., & CO.**, Boston, Massachusetts.
**POTTER & WRIGHTINGTON**, Boston, Massachusetts.

DIVISION XXIII.

**Models and plans of dwellings.**

United States Commission of Fish and Fisheries. Collective Exhibit.

Groups 106, 107.

DIVISION XXIV.

**Contracts of partnerships; insurances of, life, boats, gear, &c., benefit societies.**

United States Commission of Fish and Fisheries. Collective Exhibit.

Group 108.

**HELLMAN, HENRY**, Camden, Maine.

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## CLASS III.

## COMMERCIAL AND ECONOMIC.

DIVISION XXV.

**Preparation, preservation, and utilization of fish.**

(a) For edible purposes—
i. Models of fish-curing establishments. Methods of, and models and other representations of any appliances for, drying, curing, salting, smoking, tinning, cooking, &c.

United States Commission of Fish and Fisheries. Collective Exhibit.

Groups 79, 124, 125, 126, 127, 128, 129.

**ATWATER, PROF. W. O.**, Middletown, Connecticut.

DIVISION XXVI.

ii. Fish dried, smoked, cured, salted, tinned, or otherwise prepared for food.

United States Commission of Fish and Fisheries. Collective Exhibit.

Groups 130, 131, 132, 133, 134, 135, 136.

**ALDEN, CHARLES**, Gloucester, Massachusetts.

**AMS, MAX**, New York, **ALBANY BEEF PACKING COMPANY.**

**BADOLLET & CO.** (and **TILLAMOOK PACKING COMPANY**), Astoria, Oregon.

**BAILEY, ARTHUR H., & CO.**, Boston, Massachusetts.

**BEARDSLEY'S, J. W., SONS**, New York City.

**BOOTH, A.**, Baltimore, Chicago, and Astoria.

**BURNHAM & MORRILL**, Portland, Maine.

**CASTINE PACKING COMPANY**, Castine, Maine.

**CUTTING PACKING COMPANY**, San Francisco.

**DE BUTTS & DAGGETTS**, Boston, Massachusetts.

**HINE & CO.**, New York City.

**HUME, WILLIAM**, Astoria, Oregon.

**LEWIS, W. K., & BROTHERS**, Boston, Massachusetts.

**McMENAMIN & CO.**, Hampton, Virginia.

**MAYO, HENRY, & CO.**, Boston, Massachusetts.

**MEGLER, J. G., & Co.**, Brookfield, Wahkiakum Co., Washington Territory.

**OREGON PACKING COMPANY** (J. W. & B. Cook), Portland, Oregon.

**PERKINS & SHURTLEFF**, Portland, Maine.

**PICKERT, L., & CO.**, Boston, Massachusetts.

**POTTER & WRIGHTINGTON**, Boston, Massachusetts.

**PORTLAND PACKING COMPANY**, Portland, Maine.

**QUINN, JAMES**, Quinnis, Oregon.

**ROSENSTEIN BROTHERS**, New York City.

**SCHMIDT, S., & CO.**, New York City.

**SIEWARD, F. H., & SONS**, Baltimore, Maryland.

**WOLFF & RIESING**, Eastport, Maine.

## Division XXVII.

iii. All products prepared from fish, such as oils, roes, isinglass, &c.

United States Commission of Fish and Fisheries. Collective Exhibit.

Groups 140, 147.

**DODD, A. W., & CO.**, Gloucester, Massachusetts.

**UNITED STATES ALBUMEN MANUFACTURING COMPANY**, Osterville, Massachusetts.

**SCHMIDT, S., & CO.**, New York City.

## Division XXVIII.

iv. Antiseptics suitable for preserving fish for food.

Jnited States Commission of Fish and Fisheries. Collective Exhibit.

Group 127.

## Division XXIX.

(b) For other than edible purposes—
i. Oils, manures, and other products prepared from fish.

'nited States Commission of Fish and Fisheries. Collective Exhibit.

Groups 149, 152.

**.BBE, W. A.,** New Bedford, Massachusetts.

**.LBANY BEEF PACKING COMPANY.**

**ARTLETT, J. H., & SONS,** New Bedford, Massachusetts.

**OOK, CALEB,** Provincetown, Massachusetts.

**ODD, A. W., & CO.,** Gloucester, Massachusetts.

**UNAN, WINFIELD S.,** Baltimore, Maryland.

**EORGE W. MILES COMPANY, THE,** Milford, Connecticut.

**LOUCESTER ISINGLASS AND GLUE COMPANY,** Gloucester, Massachusetts.

**AVEN, WILLIAMS & CO.,** New London, Connecticut.

**RYER, JASPER,** New York City.

**UINNIPIAC FERTILIZER COMPANY,** New London, Connecticut.

**USSIAN CEMENT COMPANY,** Gloucester, Massachusetts.

**OLUBLE PACIFIC GUANO COMPANY,** Wood's Holl, Massachusetts.

## Division XXX.

ii. Methods of, and models, and other representations of appliances for preparing oils and manures from fish.

nited States Commission of Fish and Fisheries. Collective Exhibit.

Groups 111, 113, 119, 124, 125, 128.

## Division XXXI.

iii. Sea and fresh-water pearl shells: mother-of-pearl manufactured pearls sorted.

Inited States Commission of Fish and Fisheries. Collective Exhibit.

Groups 144, 145.

## Division XXXII.

iv. Preparation and application of sponges, corals, pearls, shells, and all parts and products of aquatic animals, &c., to purposes useful and ornamental, with specimens.

United States Commission of Fish and Fisheries. Collective Exhibit.

Groups 137, 138, 139, 140, 141, 142, 143, 146.

**ALASKA COMMERCIAL COMPANY.**

**BARTLETT, J. H., & SONS,** New Bedford, Massachusetts.

**CHESTER, H. C.,** Noank, Connecticut.

**COLE, CHARLES A.,** Scituate, Massachusetts.

**MAHRENHOLZ, H. J.,** New York City.

**STINEMETZ, B. H.,** Washington.

**TIFFANY & CO.,** New York City and Paris.

**WING, J. & W. R.,** New Bedford, Massachusetts.

**WYETH, JOHN, & BRO.,** Philadelphia, Pennsylvania.

## Division XXXIII.

### Transport and sale of fish.

(*a*) Appliances for carrying fish and for preserving fish during transport or otherwise, and models of the same.

United States Commission of Fish and Fisheries. Collective Exhibit.

Groups 122, 123, 128.

**CHASE, A. J.,** Boston, Massachusetts.

**MANN & CO.,** Chicago, Illinois.

**OSGOOD, W. A.,** Battle Creek, Michigan.

**RIDGWAY PATENT REFRIGERATOR COMPANY** (Limited), Philadelphia.

**ROBINSON, WILLIAMS, & CO.,** New Haven, Connecticut.

## Division XXXIV.

(*b*) Models of fish-markets and appliances connected with the same.

United States Commission of Fish and Fisheries. Collective Exhibit.

Group 124.

**BLACKFORD, EUGENE G.,** New York City.

**FAIRBANKS & CO.,** New York City.

**LOW, D. W.,** Gloucester, Massachusetts.

## CLASS IV.

## FISH CULTURE.

### DIVISION XXXV.

**Models of drawings of fish hatching, breeding, and rearing establishments, including oyster and other shellfish grounds, and all apparatus and implements connected with the same, and for transporting fish and fish ova. Food for fry.**

United States Commission of Fish and Fisheries. Collective Exhibit.

Groups 41, 153, 154, 155, 156, 157, 158, 159, 160, 161, 162, 163.

**AINSWORTH, STEPHEN H.**, New York.
**ANNIN, JAMES, JUN.**, Caledonia, New York.
**ATKINS, CHARLES G.**, Bucksport, Maine.
**BRACKETT, E. A.**, Winchester, Massachusetts.
**BRYAN, O. N.**, Occokesk, Maryland.
**CHASE, OREN M.**, Detroit, Michigan.
**CHESTER, H. C.**, Noank, Connecticut.
**CLARK, FRANK N.**, Northville, Michigan.
**COLLINS, A. S.**, Caledonia, New York.
**DELAWDER, W. G.**, Easton, Maryland.
**FERGUSON, MAJOR THOMAS B.**, Washington.
**GREEN, SETH**, Rochester, New York.
**GREEN, MONROE A.**, Rochester, New York.
**McDONALD, MARSHALL**, Washington.
**MATHER, FREDERICK**, New York.
**PARKER, JOEL C.**, Grand Rapids, Michigan.
**RICARDO, GEORGE**, Hackensack, New Jersey.
**STILWELL, E. M.**, Bangor, Maine.
**STONE, LIVINGSTON**, Charlestown, New Hampshire.
**TAYLOR, THOMAS**, New Berne, North Carolina.
**WRIGHT, ISAAC H.**, Baltimore, Maryland.
**WROTEN, WILLIAM G.**, Maryland.

DIVISION XXXVI.

**Representations illustrative of the development and progressive growth of fish.**

United States Commission of Fish and Fisheries. Collective Exhibit.

Groups 164, 165, 166.

**ATKINS, CHARLES G.**, Bucksport, Maine.
**CLARK, FRANK N.**, Northville, Michigan.
**EARLL, R. EDWARD**, Washington.
**GREEN, SETH**, Rochester, New York.
**McKESSON AND ROBBINS**, New York City.
**McDONALD, MARSHALL**, Washington.
**RYDER, JOHN A.**, Washington.
**STONE, LIVINGSTON**, Charlestown, New Hampshire.

DIVISION XXXVII.

**Models and drawings of fish passes and fish ladders.**

United States Commission of Fish and Fisheries. Collective Exhibit.

Group 167.

**ATKINS, CHARLES G.**, Bucksport, Maine.
**BRACKETT, E. A.**, Winchester, Massachusetts.
**BREWER, JAMES D.**, Muncy, Pennsylvania.
**EVERLETH, F. M.**, Waldoboro, Maine.
**McDONALD, MARSHALL**, Washington.
**PIKE, ROBERT G.**, Middletown, Connecticut.
**SHAW, B. F.**, Anamosa, Iowa.
**SMITH, EVERETT**, Portland, Maine.
**WORRALL, JAMES**, Columbia, Pennsylvania.

DIVISION XXXVIII.

**Scientific investigations.**

i. Models and drawing of diseases of fish, with special reference to their origin and cure.

(No display.)

DIVISION XXXIX.

ii. Processes for rendering streams polluted by sewage and chemical and other works innocuous to fish life (illustrated by models and drawings).

United States Commission of Fish and Fisheries. Collective Exhibit.

Group 167.

## DIVISION XL.

i. Physico-chemical investigation into those qualities of salt and fresh water which affect aquatic animals; investigation of the bottom of the sea and of lakes shown by samples; aquatic plants in relation to fishing, &c.; researches into the aquatic fauna (animals of the several classes preserved in alcohol or prepared, &c.); apparatus and implements used in such researches.

United States Commission of Fish and Fisheries. Collective Exhibit.

Groups 36, 37, 38, 43, 170, 171, 172.

**GASSIZ, ALEXANDER,** Museum of Comparative Zoology, Cambridge, Massachusetts.

**AILLIE,** Passed Assistant Engineer, U.S.N., United States steamer "Fish Hawk."

**ENEDICT, J. E.,** United States steamer "Albatross."

**HESTER, H. C.,** Noank, Connecticut.

**ILGARD, PROF. J. E.,** Washington.

**OTTS, EDWARD,** Philadelphia, Pennsylvania.

**IGSBEE, CHARLES D.,** Commander, U.S.N.

**ANNER, LIEUT. Z. L.,** U.S.N., United States steamer "Albatross."

**NITED STATES COAST AND GEODETIC SURVEY.**

**NITED STATES NAVY, HYDROGRAPHIC OFFICE.**

## DIVISION XLI.

**Acclimatization of fish.**

United States Commission of Fish and Fisheries. Collective Exhibit.

Group 153.

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## CLASS V.

## NATURAL HISTORY.

## DIVISION XLII.

**ecimens living (marine and fresh-water), fresh, stuffed, r preserved, casts, drawings, and representations of—**

(a) Algæ arranged according to their various species and localities.

United States Commission of Fish and Fisheries. Collective Exhibit.

Groups 34, 35.

**RLOW, DR. W. G.,** Harvard College, Cambridge, Massachusetts.

## Division XLIII.

(b) Sponges, in their natural state.

United States Commission of Fish and Fisheries. Collective Exhibit.

Groups 32, 148.

**McKESSON & ROBBINS,** New York City.

**POTTS, EDWARD,** Philadelphia, Pennsylvania.

## Division XLIV.

(c) Corals, in their natural state, polyps, jelly fish, &c.

United States Commission of Fish and Fisheries. Collective Exhibit.

Group 31.

**RATHBUN, RICHARD,** United States National Museum, Washington, District Columbia.

## Division XLV.

(d) Entozoa.

(No display.)

## Division XLVI.

(e) Mollusca of all kinds and shells not included in Class III.

## DIVISION XLIX.

Perfect insects and larvæ of insects which are destroyers of spawn or serve as food for fish.

United States Commission of Fish and Fisheries. Collective Exhibit.

Group 56.

:cGOVERN, H. D., Brooklyn, New York.

ILEY, C. V., Washington, District Columbia.

## DIVISION L.

(*i*) Crustacea of all kinds.

United States Commission of Fish and Fisheries. Collective Exhibit.

Groups 29, 33.

LUCAS, F. A., U. S. National Museum, Washington.

## DIVISION LI.

(*k*) Fish of all kinds.

United States Commission of Fish and Fisheries. Collective Exhibit.

Groups 13, 20.

BLACKFORD, EUGENE G., New York City.

BRACKETT, WALTER M., Boston, Massachusetts (pictures).

FREEMAN, MRS. J. H., Wellfleet, Massachusetts (pictures).

MATHER, FRED, New York City.

MATHER, MRS. FREDERICK, New York City. (Picture.)

SMILLIE, T. W., Washington.

STILWELL, E. M., Bangor, Maine.

TODD, H. L., United States Fish Commission, Washington, District Columbia (pictures).

WONSON, EVERETT P., Gloucester, Massachusetts.

PHOTO-ENGRAVING COMPANY, 67, Park Place, New York City. (Engravings.)

## DIVISION LII.

(*l*) Reptiles, such as tortoises, turtles, terrapins, lizards, serpents, frogs, newts, &c.

United States Commission of Fish and Fisheries. Collective Exhibit.

Groups 7, 8, 9, 10, 11, 12.

LUCAS, F. A., Washington.

SCHINDLER, A. Z., Washington.

### Division LIII.

(*m*) Aquatic and other birds hostile to fish or fishing.

United States Commission of Fish and Fisheries. Collective Exhibit.

Groups 5, 6.

**HORNADAY, WM. T.,** Washington.

### Division LIV.

(*n*) Aquatic and amphibious mammalia (otters, seals, whales, &c.) and others detrimental to fish.

United States Commission of Fish and Fisheries. Collective Exhibit.

Groups 1, 2, 3, 4.

**ALASKA COMMERCIAL COMPANY,** San Francisco, California.

**HORNADAY, W. T.,** Washington.

### Division LV.

**Works on ichthyology, maps illustrating geographical distribution, migration, &c., of fishes and spawn.**

United States Commission of Fish and Fisheries. Collective Exhibit.

Groups 39, 40, 41, 42, 43, 44, 45, 46, 173.

**AGASSIZ, ALEXANDER,** Cambridge, Massachusetts.

**ALLEN, J. A.,** Museum of Comparative Zoology, Cambridge, Massachusetts.

**BEAN, TARLETON H.,** National Museum, Washington.

**CLARK, A. HOWARD,** Washington.

**DALL, W. H.,** Washington.

**GOODE, G. BROWN,** National Museum, Washington.

**JORDAN, DAVID S.,** Bloomington, Indiana.

**LOCKINGTON, W. N.,** Philadelphia, Pennsylvania.

**MATHER, FRED.,** New York City.

**PUTNAM, PROF. F. W.,** Cambridge, Massachusetts.

**RYDER, JOHN A.,** Washington.

**SCRIBNER'S, CHARLES, SONS,** New York City.

***STEARNS*, SILAS,** Pensacola, Florida.

DIVISION LVI.

**cimens and representations illustrative of the relations between extinct and existing fishes.**

**ITE, DR. C. A.,** United States Geological Survey, Washington.

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CLASS VI.

STORY AND LITERATURE OF FISHING—FISHERY LAWS—FISH COMMERCE.

DIVISION LVII.

**cient fishing implements or their reproductions—models—pictures—books—emblems—charters and seals of ancient fishermen guilds.**

ited States Commission of Fish and Fisheries. Collective Exhibit.

Groups 168, 169, 173.

**IERICAN FISH CULTURAL ASSOCIATION,** New York City.

**NTURY COMPANY,** New York City.

**NKLIN, CAPTAIN B. F.,** Jamesport, New York.

**LTON MARKET FISHMONGERS' ASSOCIATION,** New York City.

**ETHYOPHAGOUS CLUB,** New York City.

**ILLIPS, BARNET,** New York City.

**.U, DR. CHARLES,** Washington.

**ANLEY, HENRY O.,** Dixfield, Maine.

(For Pictures—*See* under Division LI.)

DIVISION LVIII.

**Fishery laws of different countries.**

(*See* under Division LXI.)

DIVISION LIX.

**pies of treaties, conventions, &c., dealing with international fishery relations.**

(*See* under Division LXI.)

DIVISION LX.

**ports, statistics, and literature of fish, fishing, and fisheries.**

(*See* under Division LXI.)

## Division LXI.

### Reports on acclimatization of fish, and of attempts in this direction.

United States Commission of Fish and Fisheries. Collective Exhibit.

Group 173.

**ALLEN, J. A.,** Museum of Comparative Zoology, Cambridge, Massachusetts.

**AMERICAN ANGLER,** New York City.

**AMERICAN FIELD,** Chicago, Illinois.

**BARTLETT, JOHN,** Cambridge, Massachusetts.

**BEAN, DR. TARLETON H.,** United States National Museum, Washington.

**CLARK, A. HOWARD,** United States National Museum, Washington.

**COLLINS, JOSEPH W.,** United States Fish Commission, Washington.

**DALL, CAPTAIN W. H.,** United States Coast Survey, Washington.

**EARLL, R. E.,** United States Fish Commission, Washington.

**ELLIOTT, HENRY W.,** Washington.

**FAXON, WALTER,** Museum of Comparative Zoology, Cambridge, Massachusetts.

**FEWKES, J. WALTER,** Museum of Comparative Zoology, Cambridge, Massachusetts.

**FOREST AND STREAM PUBLISHING COMPANY,** New York.

**GOODE, G. BROWN,** National Museum, Washington.

**HARGER, OSCAR,** Peabody Museum of Yale College, New Haven, Connecticut.

**JORDAN, PROF. DAVID S.,** Indiana University, Bloomington, Indiana.

**LOCKINGTON, W. N.,** Philadelphia, Pennsylvania.

**MUSEUM OF COMPARATIVE ZOOLOGY,** Cambridge, Massachusetts.

**PACKARD, PROF. A. S., JUN.,** Providence Rhode Island.

**PROCTER BROTHERS,** Gloucester, Massachusetts.

**RATHBUN, RICHARD,** United States National Museum, Washington.

**RIDGWAY, ROBERT,** United States National Museum, Washington.

ILEY, C. V., United States Department of Agriculture, Washington.

YDER, JOHN A., United States Fish Commission, Washington.

SCAMMON, CAPTAIN C. M., United States Revenue Marine, San Francisco, California.

SCRIBNER'S, CHARLES, SONS, New York City.

SEA WORLD PUBLISHING COMPANY, Baltimore, Md.

SMILEY, C. W., United States Fish Commission, Washington.

SMITHSONIAN INSTITUTION, Washington.

STEARNS, SILAS, Pensacola, Florida.

SWAN, JAMES G., Port Townsend, Washington Territory.

UNITED STATES COAST AND GEODETIC SURVEY, Washington.

UNITED STATES DEPARTMENT OF THE INTERIOR, CENSUS OFFICE, Washington.

UNITED STATES DEPARTMENT OF THE INTERIOR, PATENT OFFICE, Washington.

UNITED STATES DEPARTMENT OF THE TREASURY, BUREAU OF STATISTICS, Washington.

UNITED STATES NATIONAL MUSEUM, Washington, District Columbia.

VERRILL, PROF. A. E., Yale College, New Haven, Connecticut.

WILCOX, W. A., Secretary Boston Fish Bureau, Boston.

WINSLOW, LIEUTENANT FRANCIS, U.S.N., United States Fish Commission, Washington.

# BELGIUM.

THE most important fishery of Belgium is the maritime fishery, which is extensively carried on along the shores of the North Sea and in Western Flanders, especially at Ostend. Since 1830 the fishing industry has greatly developed.

Thus the harbours of Ostend, Blankenberghe, Heyst, Panne, and Nieuport, which numbered 175 boats in 1836, had 318 in 1880. Ostend alone, the most important fishing port, possessed in 1836 82 fishing-boats, 185 in 1880, 206 in 1881, and 178 in 1882.

Since 1830 the Government has exerted itself by every means to encourage and develop the fishing industry upon the Belgian coasts. Those engaged in it enjoyed an exemption from an entire series of dues, and government grants in aid of the fishery were allowed annually until the year 1866. These grants in no way assisted the development of the fisheries; in fact their importance diminished year by year. In 1864 those interested in maritime fishing showed their anxiety for its future. The Government thereupon appointed a commission (20th April, 1865) for the purpose of inquiring into the condition of this fishery, and to take proper measures for its preservation. The report of the commission presented to the Chamber of Representatives on the 17th May, 1866, recommended the entire abolition of the grants to the various fisheries; it applied for the foundation of a school for seamen on board a vessel that should exercise at sea the supervision of the fishery: and it also recommended the free entry of fish from all nationalities. Besides this the commission considered that for the re-establishment of its fisheries the country must rely upon private enterprise, a good organization of the fishery fleet, and a fair rate of wages for the fishermen. The Government has endeavoured to carry out the recommendations of the commission.

The grants were definitely suppressed in 1867. The Government chartered at the same time a large vessel for the supervision of the fishery. They instituted likewise a school for seamen destined for the crew of the fleet. Each year, this ship, at the commencement of June, cruises for four months in the North Sea in the midst of our fishing-boats. Its mission is to prevent the fishermen from neglecting their duty by smuggling upon the coast of England, to give them help and advice, and to furnish them with medical aid in cases of accident, &c.

Notwithstanding the foundation of the school for seamen, which numbers at present sixty young men, on account of the increase of the number of fishermen's boats, complaints are made of the difficulty of procuring the requisite crews. This arises from the fact that most of the lads trained on the guardship enter the mercantile marine, the mail service, or work in light ships, &c., as soon as the guardship, on its return from the summer cruise, winters in the port of Ostend. The school for seamen trains therefore good sailors but few fishermen—hence the scarcity. To remedy this state of affairs, it is proposed that the government should cause a large cutter to be constructed, manned with seamen from the guardship, who, in winter, would devote themselves to net fishing. These young men would thus learn net-fishing as in summer they learnt fishing with hooks. They would then be more surely retained for the principal industry of our coasts. The cutter in question would in addition be provided with all practical improvements, such as a steam winch for raising the net. It could, besides, visit the principal ports and fish depôts of England for general information.

ıe same time that the Government abolished the premiums and established ining-ship for seamen, it suppressed all restrictive regulation of fishing, the law respecting the size of the mesh of the nets according to the time , to prevent the destruction of fry.

ie competent to judge expressed an opinion that these measures, besides vexatious to fishermen, did not benefit the fishing industry, and that, no what might be the mode of fishing employed, there was no reason to scarcity of fish in the North Sea. The result, both in this country and in d, since the free system was introduced, proves that that opinion was well d.

870 a law abolished the inland duties established on salt, and sea water; 2 declares the suppression of the dues on all fish importations.

sea fishery, freed from all restrictions, has not been slow in developing. stated in the first part of this report, the number of smacks has erably increased, and their construction has also improved. Our ship-s, in imitation of the English, have adopted boats that for shape and g will bear comparison with any. Built for rapid sailing, which is ary for abundant harvests of fish, they are still unsatisfactory, but that is ılt of the fishermen, who cannot handle them so dexterously as their ıh neighbours.

s an incontestable fact that, although since 1830 prices have at least d, the sale of sea fish has grown enormously. Fish always abounds in arket of Ostend, and the supply increases every year. Since 1875 the ipality of Ostend has taken over the management of the fish market. The ing is a table of the annual proceeds of the sale of fish at this market since uisition by the corporation :—

| oduce. | 1875. | 1876. | 1877. | 1878. |
|---|---|---|---|---|
| ish . . | 333,812·50 | 457,142·30 | 424,788·05 | 539,867·20 |
| ch . . | 471,655·10 | 568,360·00 | 344,105·80 | 623,608·70 |
| h . . | 9,682·20 | 8,543·60 | 8,376·20 | ,, |
| r Nations | 1,565·00 | 14,945·00 | 10,037·00 | 28,540·00 |
| ian . . stend) | 1,490,956·85 | 1,577,984·65 | 1,800,394·85 | 1,884,752·30 |
| tal frs. . | 2,307,671·65 | 2,626,975·55 | 2,587,701·90 | 3,076,768·20 |

| roduce. | 1879. | 1880. | 1881. | 1882. |
|---|---|---|---|---|
| lish . . | 641,242·55 | 442,445·89 | 363,355·00 | 586,325·50 |
| ch . . | 437,543·20 | 544,936·15 | 605,447·40 | 615,219·10 |
| h . . | ,, | ,, | 2,090·50 | 1,610·40 |
| r Nations | 76,102·50 | 2,248·30 | 592·94 | 58,359·00 |
| ian . . Ostend) | 1,842,934·20 | 2,520,089·05 | 1,953,256·20 | 2,207,073·60 |
| tal frs. . | 2,997,822·45 | 3,489,719·39 | — | 3,468,587·60 |
| liver oil . | — | — | 268·50 | — |
| Total . . | — | — | 2,925,010·54 | — |

The following is the produce for the two first months of 1883:—

| | Belgian. | English. | French. | Sundries (small fish) |
|---|---|---|---|---|
| January . | 271,193·05 | 44,259·50 | 58,312·50 | 11,607·00 |
| February . | 239,956·60 | 39,674·00 | 40,056·70 | 9,626·00 |
| Total . | 511,149·65 | 83,933·50 | 98,369·20 | 21,233·00 |

This considerable development of national fishery does not appear to have suffered by the importation of fish in vessels other than fishing vessels, nor by what is brought by rail. And yet these importations have greatly increased, steamers arriving at Antwerp constantly, half laden with fish, from Hull and Grimsby. Besides this, a great deal comes by rail from Holland. The following is a statement of the foreign trade during the last two years:—

| Importation and Exportation. | Herrings. | | Other fish. | |
|---|---|---|---|---|
| | 1881. | 1882. | 1881. | 1882. |
| Importations, kilog. . | 7,553,597 | 8,536,998 | 8,571,000 | 7,870,816 |
| Exportations „ . | 70,765 | 270,005 | 996,641 | 1,159,836 |

Our shipowners are, at the same time, contractors. They supply sails, ropes, ferry boats, barrels, &c.,—in fact, everything. They have coopers' sheds, sail-lofts, &c. Our fishermen complain that they are not so well paid as the English fishermen, notwithstanding the enormous profits realised by the shipowners. The fishermen receive only 6 per cent. on the proceeds of the sale. Furthermore, 1 per cent. of this allowance is kept back, for the purpose of making good losses resulting from the loss of fishing-tackle, ropes, &c., which loss is charged to the fishermen and owners, and when, at the end of the season, the accounts are balanced, the share to be paid by the fishermen is deducted, either from their salary, or from their share of the proceeds of the fishery.

For a long time there has existed a Fishermen's Aid Society, an association of mutual assistance, which provides help for members when they can no longer go to sea. In order to implant a taste for fishing among the children of the population on the sea coast, and to give them at an early age some knowledge of it, an elementary acquaintance with the subject is imparted in some of the normal schools. Monsieur Ch. De Smet of Ostend is one of the promoters of the idea of giving instruction in fishery matters in these schools. He has also had exhibited life-sized diagrams of the principal fish of our coasts. His collection, which was shown at the National Exhibition of 1880, is now at the *École Communale* at Ostend.

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Besides the maritime fishing, we have in Belgium river fishing, which, though less important, is still of great value on the ground of public revenue and as a food product.

The mountainous parts of our provinces are in a great measure restricted to river and stream fish, on an average dearer, less nutritious and more irregular in the supply than sea fish.

Considering the numerous and various advantages which the fresh-water fisheries present, and in view of the impoverishment of our streams, the government had for a long time been urged the reform to legislation concerning

ing, which was governed by laws dating as far back as 1669 and 1804. A new was instituted on the 15th February, 1883. Good results are expected from is law and the measures which will be taken to enforce its observance.

The following are some figures relating to the distance in kilometres of the ght of fishing in rivers, streams, canals or parts of them, let out by contract.

RIVERS AND STREAMS.

| | kilos. | |
|---|---|---|
| Basin of the Escant | 514,517 | |
| Basin of the Meuse | 540,238 | |
| Basin of the Yser | 45,534 | |
| | | 1,100,289 |

CANALS.

| | | |
|---|---|---|
| Basin of the Escant | 417,898 | |
| Basin of the Meuse | 65,841 | |
| Basin of the Yser | 39,819 | |
| Other canals | 175,668 | |
| | | 699,226 |
| | | 1,799,515 |

The inspection and preservation of fishing in streams through public lands vested in the Belgian Department of Woods and Forests (*L'Administration restière*).

In the public canals and rivers, the fishing is let by tender, as in other state vinces, or by license when no other offers are made. There are fixed scales ich form the basis of these two ways of letting.

The fishery rents amounted to—

| | |
|---|---|
| In 1861 | 40,180·58 |
| 1865 | 43,369·71 |
| 1870 | 40,088·97 |
| 1875 | 52,365·21 |

To assist in re-stocking our streams, the government, on the 21st January, 883, issued a royal decree, by which fishing is prohibited for the space of one ar in those parts of streams, not navigable, that run through domains bject to the Department.

In 1861 certain parties interested in such matters founded the "Belgian ciety of Pisciculture." Its object was to create one or more ichthyological tablishments, to propagate, according to the best method, all fish, crustaceans d molluscs, of this and other countries, which are considered the most useful r consumption. This society was subsidised by government until 1866, when e stoppage of state grants caused the society to be wound up. It had never en a great success, nor produced any important results. Its failure, however, ed not make us despair for the future, as the question of artificial fish-rearing s still comparatively an open one.

## LIST OF EXHIBITORS.

### FISHING.

[SEA-FISHING.]

DIVISION I.

**Gear of every description and of all nations used in trawl, herring, long line, hand line, and every other mode or system of fishing, including all nets, lines, hooks, harpoons, tackle, &c., employed in the same.**

**CASTEELS DE COENE, HENRI,** 10 Rue du Cercle, Ostend.
Ropes of all kinds, trawling-nets and tackle. All mounted ready for use.

**EVERAERTS-DESMIDT, D.,** 12 Quai de l'Empereur, Ostend.
Tackle used in cod-fishing at the Dogger Bank.
Tackle for deep-sea fishing at the Farö Islands and Iceland.

Bait for Dogger Bank Fishery.

**PEDE, AUGUSTE,** 52 Rue de l'Est, Ostend.
Fishing Net of the vessel "Gouverneur Heyvaert," with arms, cable, yard, two net-irons, and accessories, ready for launching.

*** This net has the form of a cone, whose axis is from 20 to 22 mètres, the diameter of the bar being 12 mètres. Length of yard 12 mètres (on the ground).

**PYCKE, O.,** St. Georges.
Drag Net.
Two Small Nets accessory to fishing.
Fishing Ropery.
Two Osier Landing Nets.
Hemp for Spinning and Weaving.

**VILLE DE BLANKENBERGHE.**

| | |
|---|---|
| Smack completely equipped (model). | Anchor. |
| Cable. | Lantern. |
| Line. | Gaff Hook. |
| Bowline. | Flare-up. |
| | Compass. |

**ANDERSON, ABBOTT et ANDERSON,**

**37, Queen Victoria Street, Londres, Angleterre,**

UNIQUES FABRICANTS et FOURNISSEURS de la Police Métropolitaine de Londres de leurs *Collets imperméables*, dont se servent tous les principaux Sergents de ville anglais, irlandais et écossais.

**LE DE BLANKENBERGHE**—*continued.*

Lead Sounding Line.
Fish Basket.
Hammer.
Pitch Kettle.
Pail.
Water Barrel.
Net.
Trouville Chain.
Net Irons.
Yard for shooting the Net.
Coils of Rope, Three.
Other Anchors.
Buoys, Two.
Another Net.
Sardine Net.

**LE DE HEYST-SUR-MER.**

Pole Nets :—
  Two Nets for Codfish.
  Two Haddock Nets.
  Five Anchors.
  Two Chains (buoy).
  Two Ropes for Buoys.
Nets :—
  One Folding Net.
  One ditto, *à cartelet.*
  One ditto, *raie.*
  Various Lines.
Large Net :—
  Net.
  Net Rod.
  Net Irons.
  Pole.
Cable.
Cable, Trouville.
Cable for Net.
Sardine Net :—
  One Net.
  Pole.
  Rods.
Net for Prawns.
Two small embarkations for fishing.
Sailors' Outfits.

DIVISION III.

**ishing craft of all nations; models and representations he same.**

**CIÉTÉ ANONYME BELGE DE LITHO-PEINTURE,** 3 Place de Brouckere, Brussels.
Ten large Pictures illustrating the fisheries of Belgium.

Sixteen Pictures (reduced from the preceding ten).

DIVISION IV.

**ishing vessels and boats other than steam vessels.**

**WEERT, LOUIS,** 45 Quai du Chantier, Ostend.
Models of two fishing smacks, with plans.

**WYMMER, JOSEPH,** Rue des Frères, Ostend.
Dandy Cutter, rigged, with plans.

**IDERSON, ABBOTT, & ANDERSON,**

**37, Queen Victoria Street, London, England,**

hmt in Canada, Australien, Neu-Seeland, Cap der guten Hoffnung, Natal, n, China, als die einzigen zuverlässigen Fabrikanten von OELHAEUTEN, he zur Verschiffung verpackt am Bestimmungsort in wohl behaltenem und tadellosem Zustande anlangen.

DIVISION V.

**Ropes and canvas suitable to fishing vessels.**

**BAMBOIS & CIE.**, Rue Laviesse 30, Liege.
Sail Cloth tanned for sea use.
Sail Cloth tanned and made waterproof by a new process.
Various samples of tanned Cables.
This tanning prevents the decay of sail cloth, nets, ropes, &c., from the action of salt water.

**DOBBELAERE KULIN, J. B.**, Ghent.
Collection of Sail Cloths, English breadth 24 inches or 61 centimètres.
Ditto, Dutch breadth 30 inches or 76 centimètres.

8 rolls Cloth, "Marine Royale," extra quality, Italian hemp.

6 rolls Sail Cloth, 76 centimètres broad, used in Dutch fisheries.

**VERTONGEN, GOENS**, Termonde.
Coil of Rope used for fisheries.

**VROOME, ALBERT**, Place du Commerce, Ostend.
Sail Cloth for Fishing Vessels, 46 rolls.

DIVISION VI.

**Steam and hand capstans, compasses, barometers, telescopes, lights, lamps, fog horns, systems of signalling at night for fishing fleets and vessels, electric lights, luminous paint, and other equipment of fishing vessels, charts for fishermen.**

**DE COENE, PHILIPPE**, Ostend.
Capstan. May be worked with handles or handspikes.

DIVISION VIII.

**Fishing tackle and netting in different stages of preparation, and machinery used for working up the raw material.**

**GRANDJEAN, DEMORY**, Tailfer Lusten.
Materials of every description for line fishing.

DIVISION IX.

**Life-boats, their equipment, and life-saving apparatus of every description.**

**GOLDENBERG, C. E.**, Antwerp.
Life-Boat.

## FRESHWATER FISHING.

### Division XIII.

**Salmon nets and fixed appliances for catching salonidæ in all their varieties.**

**OLY, J.,** Rue de la Princesse, Antwerp.
Nets for Freshwater Fishing.

### Division XIV.

**Salmon rods, reels, lines, artificial flies and baits, gaffs, pears, creels, &c.**

**RANDJEAN, DEMORY,** Taifler Lusten.
Rods for Salmon Fishing, Lines, Traps, &c.

### Division XV.

**Trout rods, reels, landing nets, lines, artificial flies, baits, baskets, bags, &c.**

**RANDJEAN, DEMORY,** Tailfer Lusten.
Trout Rods, Lines, Traps, &c.

**UGROIS, HUBERT, AÎNÉ,** Durbuy.
Trout Rod.

### Division XVI.

**Pike, barbel, and other coarse-fish rods, reels and tackle, artificial spinning baits, &c.**

**RANDJEAN, DEMORY,** Tailfer Lusten.
Pike Rods, Lines, &c.

### Division XVII.

**Traps, nets, bucks, wheels, and all kinds of apparatus for catching eels, lampreys, &c.**

**RANDJEAN, DEMORY,** Tailfer Lusten.
Nets and other appliances suitable for catching eels.

**ANDERSON, ABBOTT, & ANDERSON,**
**37, Queen Victoria Street, London, England.**
Bedeutenste Fabrikanten der Welt für
**OELHAUT KLEIDUNGSSTUECKE.**
Preis-Medaillien aller Industriellen Ausstellungen.

**POHL-ADLER, PIERRE,** St. Ghislain.
Eel Trap made of osier.
Do. do.

**PYCKE, O.,** St. Georges.
Net (*didon*) for catching eels.

DIVISION XIX.

**Anglers' apparel of every description.**

**GRAF, ÉMILE,** 8 Passage Lemoinier, Liège.
Fisherman's Wallet for carrying provisions.
Leather Case for carrying fishing rods.
Fishing Gaiters.

**VILLE DE BLANKENBERGHE.**
Fisherman's Costume.
Fisherwoman's Costume.

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CLASS V.

NATURAL HISTORY.

[AQUARIA.]

DIVISION XLII.

**Specimens living (marine and fresh water), fresh, stuffed or preserved, casts, drawings and representations of—**

(*a*) Algæ to be arranged under genera and species, with localities appended.

**LANTZWEERT, EDOUARD,** Rue de la Chapelle 85, Ostend.
Thalassiophytes of the coasts of Ostend.

DIVISION XLIV.

(*c*) Corals, in their natural state, polyps, jelly-fish, &c.

**LANTZWEERT, EDOUARD,** Rue de la Chapelle 85, Ostend.
Four Frames. Collection of polypi from the Belgian shores.

ANDERSON, ABBOTT, AND ANDERSON'S
WATERPROOF
OILSKIN SUITS
ARE UNEQUALLED.
37, Queen Victoria Street, London, E.C.

DIVISION LI.

**Fish of all kinds.**

**VERAERTS, DESMIDT D.**, 12, Quai de l'Empereur, Ostend.
Barrel of Codfish—Season 1883.

**OHL-ADLER, PIERRE**, St. Ghislain.
Sturgeon, killed by Exhibitor, length 2·17c.
Carp, caught by Exhibitor in the Condé Canal.
Otter, killed by Exhibitor.

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HISTORY AND LITERATURE OF FISHING—FISHERY LAWS—FISH COMMERCE.

DIVISION LVII.

**Ancient fishing implements or their reproductions, models, pictures, books, emblems, charters and seals of ancient fishermen guilds.**

**FLORENVILLE, CHARLES & DEGUAITA EDWARD,** 2 Rue de joie, Liège.
Certificate, suitable for Corporations and Public Bodies, in water-marked Paper, to be reproduced on Stone.

DIVISIONS LX. AND LXI.

**Reports, statistics, and literature of fish, fishing, and fisheries. Reports on acclimatisation of fish, and of attempts in the direction.**

**ADMINISTRATION DES PONTS ET CHAUSÉES DE BELGIQUE**, Ostend.
General Plan of the Fishery Basin at Ostend, of the *minque*, and their abutments.

ANDERSON, ABBOTT, & ANDERSON'S
Are Unequalled.
WADERS WITH BROGUES ATTACHED.
Are Guaranteed.
37, QUEEN VICTORIA STREET, LONDON, E.C.

**ASSOCIATION COMMERCIALE INDUSTRIELLE ET MARITIME**, Ostend.

Supplement to the General Plan of the Fishery Basin, containing a table showing the railway system connecting Ostend with the principal localities of Europe.

Table showing the quantity of fish sold at the Ostend *minque* from 1875 to 1883.

**DE CLERCQ, G. A.**, Inspecteur-Général des Ponts et Chaussées, 67 Rue Joseph II., Brussels.

Pamphlet entitled "Fish Culture and the Re-stocking of Belgian Waters." (La Pisciculture et le repeuplement des eaux Belges).

**MUSÉE ROYAL D'HISTOIRE NATURELLE DE BELGIQUE**, Brussels.

8 Vols., "Annals of the Museum," and 8 Atlases.

**SOCIÉTÉ ROYALE MALACOLIQUE DE BELGIQUE**, 10 Rue du Pont Neuf, Brussels.

Publications—"Annals of the Society" (vols 1 to 17), with numerous plates of Mollusca. *** This Periodical contains articles on the various fisheries, the construction of aquaria, &c.

**VAN BENEDEN, F. D.**, Rue de Namur, Louvain.

A portfolio containing plates of crustaceans, worms, and fish parasites.

**VAN DER BUSCHE, EMILE**, Bruges.

History of the Blankenberghe Fishery.

**VLIETINCK, GÉRARD**, 42 Rue Sud du Sablon, Bruges.

A work entitled "Gedenkboek der Nij Verheed tentoonstelling van West Vlaanderen," giving a description of the fishing utensils employed by the Ostend fishermen; also containing a description of the Grand Aquarium at Ostend.

The Lightest Waterproof Garments ever made.
ELEGANT, DURABLE, & CHEAP.
Complete Suit of Hat, Coat, and Leggings,
Weighs only 11 oz.
PRICE 30s.
THE LEVE ANTIPLUVIUM.
SOLE MANUFACTURERS
37, QUEEN VICTORIA STREET, LONDON, E.C.
ANDERSON, ABBOTT, & ANDERSON.

# CHINA.

particulars are taken from the official Yellow Book—No. 11, eries, Imperial Maritime Customs, China—which contains the e of the Chinese collection. The Chinese Government placed the hands of Sir Robert Hart, K.C.M.G., Inspector-General of nder his directions, an Exhibit intended to illustrate the Swatow emented by some interesting objects from Ichang, Ningpo, and n provided.

uated at the north-eastern corner of the province of Kwangtung 0′ 43″ N. and longitude 116° 39′ 3″ E., near the frontier of Fukien flows past the city, and joins the sea, after many ramifications, a the town.

ct of Swatow, T'at'oupu and Haimên on the mainland, and the a facing a mouth of the river, are the most noteworthy stations ing. Large fleets belonging to these places are daily engaged in aters.

s are laid on the fishing grounds on the part of the Government, arried on all the year round. All boats must be registered at the hey belong, and various fees, depending on the size of the boats, the authorities from the fishermen ere they are allowed to put to ces issued generally hold good for five years. At each of the d places the division of the boats and the distribution of the ent. The crews are always interested in the outturn of the sales. benefit societies of any kind where the fishermen might ensure ovide for cases of accident, nor are there assurance societies where ar might be insured against the dangers and risks of the sea.

of fishermen of the Swatow district is estimated at 12,500, but it this figure is far below the actual number.

of Swatow is not very important as regards exports to Hongkong . Cuttlefish and dried fish alone have gained attention hitherto. uyers of fish at the marts of T'at'oupu and Haimên are the inland

the season extends from March to September, but during the , July, and August, the haul is generally most abundant.

s are largely used in this district, near Namoa particularly, where rgest fishing stakes in China.

the Chinese use silk nets, which are very strong and durable.

roken shells at the mouth of the river Han forms a considerable re being no limestone found in the districts adjoining the sea- burnt into lime and about 350 boats of a carrying capacity, n two and three tons, are constantly engaged in this trade.

region of the river Han the fish are caught by strewing poisonous he water; the river being so well stocked with fish no objection is authorities to this process. For the same reason pisciculture

has not received much attention in this district, but the system of fishponds is worthy of notice.

*Ichang* is situated on the Yangtsze, nearly in the centre of China, at a distance of 1000 miles from the sea. The fishing divides itself into three kinds:—

1st. Fishing in the river itself.

2nd. Fishing in the numerous mountain streams which fall into the Yantsze.

3rd. Fishing in the shallow lakes and large ponds which abound in close proximity to the town.

Fishing with the live otter is perhaps entirely peculiar to this immediate neighbourhood.

*Ningpo.*—The city of Ningpo stands on the river Yung, twelve miles from the sea, in latitude 29° 58″ N. and longitude 121° 22′ E., about 90 miles south of Shanghai. It is the point of convergence of an extensive river and canal system, and at the same time occupies a commanding position with reference to the well-known Chusan Archipelago. Partly owing to the wealth and enterprising character of its population, and partly to its favourable situation, Ningpo is one of the most celebrated places in China for the extent and variety of its fishing industries.

*Takow, Formosa.*—The objects catalogued under this heading were gathered from so many places besides Takow itself, viz., Anping, Lambay Island, the Pescadores Islands and the South Cape, that, while termed for brevity's sake the Takow collection they may be regarded as representing the fisheries of South Formosa and the Formosa Channel.

The island of Formosa is politically a part of the Chinese province of Fukien, from which it is separated by the stormy Formosa Channel some 100 miles wide. It lies between the 22nd and 25th parallels of north latitude, and in east longitude between the 120th and 122nd meridians.

Takow was opened to foreign trade in 1863. It is thirty miles south of Taiwanfu, which was opened by the stipulations of the treaties of 1858. Anping is on the coast two miles west of Taiwanfu, the Pescadores Islands are a group of twenty-one islands in the Formosa Channel, about twenty-five miles west of Formosa. Lambay Island lies a short distance off the mainland, twelve miles south of Takow, and the South Cape is the extreme southerly point of Formosa.

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## LIST OF EXHIBITORS.

### SWATOW.

[For explanatory details, see Official Yellow Book, obtainable in Chinese Court.]

DIVISION I.

**Gear of every description and of all nations used in trawl, herring, long line, hand line, and every other mode or system of fishing, including all nets, lines, hooks, harpoons, tackle, &c., employed in the same.**

Trawl Net.
Small Trawl Net.
Large Seine.
Small Seine.
Bag Net.
Bag Net.

Seine.
Casting Net.
Stake Net.
Oiled Silk Nets.
Shellfish Net.
Large Flat Net.
Sluice Net.
Shrimp Net.
Shrimp Nets.
Shrimp Net.
Small Scoop Net.
Shell Net.
Cockle Net.
Small Flat Dip Nets.
Hemp.
Spinning Wheels.
Hempstring.
Various bands of the Casting Net.
Mangrove Bark.
Stove and Tub for dyeing and steaming the nets.
Shuttles.
Hooks.
Hooks for Cuttlefish.
Hook Baskets.
Hooks and Lines.
Silk Fish Lines.
Fish Spears.
Eel Spears.
Eel Hook.
Fish Rake.
Hooks for taking Sharks or Dog-fish.
Fish Baskets.
Shell Baskets.
Drying Nets.
Large Dip Net.
Salt Pans.

DIVISION II.

**Oyster dredges, crab, lobster, prawn, &c., pots, and other appliances for catching fish of this description.**

Fish Traps.
Dredger for Shells.
Fish Trap.
Fish Trap.
Shrimp Trap.
Eel Trap.
Crab Traps.
Fish Traps for small fish.
Fish Trap.
Shovel.
Shrimp Basket.

DIVISION IV.

Fishing Vessels and Boats other than Steam Vessels.

Models* :—

Fishing Boats.
Fishing Boat.
Two Boats with Trawl Net.
Fishing Boat and Bamboo Raft.
Bamboo Raft.
Boat for Dip Net Fishing.
Two Boats for Night Fishing.
Fishing Boat.

* Unless specially stated to the contrary, it should be understood that the models of the boats are all built to scale, ¾ in. to the foot.

THOMAS BLAND & SONS,
Gun and Rifle Manufacturers and Merchants,
106, STRAND, LONDON;
AND LIVERPOOL AND BIRMINGHAM,

Two Boats with Seine.
Namoa Fishing Fleet.
Fishing Boat.
Boats for Seine Fishing.
Fishing Boats.
Sampan.
Tic-à-tac.
Cockle-fishing Boat.
Boat for Shell-fishing.
Crab Boat.
Mandarin Boat.
Cargo Junks.*
Cargo Boats.*
Mandarin Boat.*
Cargo Boats.*
Paper Boat.*
Cargo Boat.*

DIVISION V.

**Ropes and canvas suitable for fishing vessels.**

Ropes.
Bamboo Rope covered with straw.

DIVISION VI.

**Steam and hand capstans, compasses, barometers, telescopes, lights, lamps, fog horns, systems of signalling at night for fishing fleets and vessels, electric lights, luminous paint, and other equipment of fishing vessels, charts for fishermen.**

Compass.
Oars.
Lanterns.
Anchors.
Scoops.

DIVISION XXI.

**Apparel and personal equipment.**

Articles of Dress used by Fishermen.

DIVISION XXIII.

**Models and plans of dwellings.**

Fisherman's Hut.
Models:—
Fishermen's Guildhall at Haimên.
Fishermen's Temple.

* These Exhibits are models of boats seen on the Swatow River.

## Division XXV.

**Models of fish-curing establishments. Methods of, and models and other representations of any appliances for, drying, curing, salting, smoking, tinning, cooking, &c.**

Stove for Curing Fish, with all the necessary implements.
Baskets used in curing Fish.
Fish Knives.

## Division XXVI.

**Fish, dried, smoked, cured, salted, tinned, or otherwise prepared for food.**

Dried and Salted Fish.

## Division XXVII.

**All products prepared from fish, such as oils, roes, isinglass, &c.**

Dried Shark's Fins.
Ditto Whitebait.

## Division XXXII.

Dried Seaweed.
Window in which Shells take the place of Glass.
Fog Horn made of a Shell.
Ash-cellars made of Shells.
Necklaces made of Shells.
Scoops made of Shells.
Scoops made of the Shells of the King Crab.
Lanterns made out of the Skin of the Tetrodon.
Tobacco Pipes decorated with shark skin.
Bamboo Trays for the display of Fish in Fishmongers' Shops.
Bamboo Baskets for Crabs, used by Fishmongers.

## Division XXXV.

**Models or drawings of fish hatching, breeding and rearing establishments, including oyster and other shell-fish grounds; and all apparatus and implements connected with the same, and for transporting fish and fish ova. Food for fry.**

Model—Fish Stakes.
Model—Fish Weir.
Mats.
Mud Sledge.
Model—Sluices with Nets.
Model. An Oyster Bed.
Oystermen's Tools

## Class V.

## NATURAL HISTORY.

[See Special Catalogue.]

### Division LX.

**Reports, statistics and literature of fish, fishing, fisheries.**

Map of Chinese Empire.
Chart showing the Lights erected since 1863 on the Ch Coast.
British Admiralty Maps.
Missionary Map of the Country round Swatow.
"La Pisciculture et la Pêche en Chine," par M. Dabry de Thie
"Special Catalogue of the Ningpo Collection of Exhibits f International Fishery Exhibition, Berlin, 1880."
"Reports on Trade at the Treaty Ports for the year 1880." especially, "Notes on Oyster Culture and Fishing," b B. Russell, Esq., pp. 204 and 206.

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## ICHANG.

### Division I.

**Gear of every description and of all nations us trawl, herring, long line, hand line, and every mode or system of fishing, including all nets, lines, h harpoons, tackle, &c., employed in the same.**

Line, Hooks, and Bell.
Model of Sweep Net.

### Division IV.

Fishing vessels and boats other than steam vessels.

Model of Boat, with Cast (or Bell) Net and Otter.
Model of Boat, with Dip Net and Trap attached.

### Division XVI.

**Pike, barbel, and other coarse-fish rods, reels and tac artificial spinning baits, &c.**

Coarse Fishing Rod, with Reel and Spinning Bait.
Basket, Rope and Creel.

DIVISION XVII.

**Traps, nets, bucks, wheels, and all kinds of apparatus for catching eels, lampreys, &c.**

Eel and Fish Traps and Shrimp Net.

DIVISION LVII.

**Ancient fishing implements or their reproductions—models—pictures—books—emblems—charters and seals of ancient fishermen guilds.**

Model of Boy fishing with Bamboo Spring Hooks.

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## NINGPO.

DIVISION IV.

Fishing vessels and boats other than steam vessels.

Models* :—
- Cuttle Fish Boat.
- Ice-carrying Boat.
- Boat for Night Fishing.
- Small Boat with Passenger.
- Bamboo Raft for Shallow Water.
- Cormorant Boat, full size, with cormorants and fisherman.
- Boat with Flat Net.
- Foot Boat.

Various Flags used by Fishermen.
Weathercocks used on Chinese Boats.

DIVISION XXIII.

**Models and plans of dwellings.**

Model. An Ice House.

DIVISION XXXII.

Preparation and application of sponges, corals, pearls, shells, and all parts and products of aquatic animals, &c., to purposes useful and ornamental, with specimens.

Window made of Oyster Shell.
Specimens of Shells with images inside. "Buddha Shells."

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* The models exhibited are made to scale.

DIVISION XXXV.

**Models or drawings of fish-hatching, breedin rearing establishments, including oyster and other fish grounds; and all apparatus and implements con with the same, and for transporting fish and fis Food and fry.**

Specimen of Oyster-shells from T'aichow, in the Chêhki province.

DIVISION LVII.

**Ancient fishing implements or their reproduct models—pictures—books—emblems—charters and s ancient fishermen guilds.**

Models :—
Chinese Fisherman.
Chinese Mandarin.
Chinese Gentleman.
Chinese Woman of the middle class.
Chinese Soldier.
Chinese Bride.
Chinese Boy.
Chinese Girl.
Chinese Idol.
Hanging Scrolls with Mottoes and Rubbings of Chines Inscriptions.

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## THE FISHERIES OF SOUTH FORMOSA.

DIVISION I.

**Gear of every description and of all nations us trawl, herring, long line, hand line, and every other or system of fishing, including all nets, lines, l harpoons, tackle, &c., employed in the same.**

| | |
|---|---|
| 2 Bag Nets<br>Casting Net<br>Beach Net | Takow. |
| 2 Casting Nets<br>Fish Nets<br>Pushing Net<br>Bows and Arrows<br>Fishing Rods and Lines<br>Fishing Lines<br>Fish Bag<br>Fish Baskets | South Cape. |

| | | |
|---|---|---|
| et | Lambay Island. | |
| s. Catamarans | | Anping. |
| . Country Fishing Raft with Net | | |
| Fishing Junks | | |
| 'rawl (large mesh) | | |
| 'rawl (with small meshes) | | |
| s. Bag Nets | | |
| Net, full size | | |
| Net, full size | | |
| awn Net, full size | | |
| ng Nets, full size | | |
| g Baskets, full size | | |
| 'raps, full size | | |
| sket | | |
| edger, full size | | |
| gger | | |
| ar | | |
| Hook and Rod | | |
| Rod and Hooks | | |
| Hook | | |
| k | | |

DIVISION II.

dredges, crab, lobster, prawn, &c., pots, and other ppliances for catching fish of this description.

| | |
|---|---|
| Dredger, full size | Anping. |
| Net, full size | |
| t, full size | |
| aps | |
| tcher | |

DIVISION VI.

n and hand capstans, compasses, barometers, tele- lights, lamps, fog horns, systems of signalling at for fishing fleets and vessels, electric lights, lumi- aint, and other equipment of fishing vessels, charts ermen.

ms.

## Division XXXII.

Preparation and application of sponges, corals, pearls, shells, and all pa products of aquatic animals, &c., to purposes useful and ornamenta specimens.

Spoons.
Rings.
Wine Cups.
Head Ornaments.
Paper Weights.
A Pipe made of Shell.

## Division XXXV.

**Models of drawings of fish hatching, breedin rearing establishments, including oyster and other fish grounds; and all apparatus and implements con with the same and for transporting fish and fis Food and fry.**

Rock Oysters. Bamboo Oysters.

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# CLASS V.

## NATURAL HISTORY.

[See Special Catalogue.]

# DENMARK.

## A. Denmark Proper.

nportant of the *fisheries in the open sea* are the following:—
fishery of haddock, cod, and flat fishes, carried on in the North Sea
gerak at a distance of eighteen to twenty-two English miles from the
land, by means of long lines.* The proceeds of this was estimated in
'8,000 crowns, but must be supposed to have increased since.
hook-fishery of salmon in the Baltic, carried on from Bornholm and
of which the total proceeds were estimated in 1879 at 507,800 crowns.
fishery of herrings by means of drifting nets † in the Great Belt, the
nd in the Baltic from Bornholm. The value of the autumn fishery
in the Kattegat and the Great Belt is estimated at 350,000 crowns.
st important *Coast Fishery outside the Fjords* of the Baltic and the
the Belts and the Sound, has for its object the so-called "Blanke
iety of the common eel, (*Anguilla migratoria*, Kr.). This fishery is
by means of Aalegaarde,‡ Slæbevaad,§ Pulsvaad,‖ Snurrevaad,¶
s, eel-spears, &c., and the annual proceeds are estimated at 1,600,000
esides this a certain quantity of spring-herring, cod, and gar-fish are
eans of Bundgarn.**
*shery in the Fjords* or narrow inlets from the sea, which are so
n Denmark, comprises, besides salt-water species, several fish properly
o fresh water, such as pike and perch, the water of the Fjords being
ices brackish. The value of this fishery upon the whole cannot be
ith any accuracy. Special mention must be made of the Limfjord.
rates the northernmost portion of Jutland from the main portion.
when a channel was formed between the North Sea and the head
fjord, the latter has become virtually a Sound, and the fishery has
ome a salt-water fishery. Eels are taken here by means of eel-
arious constructions, nets, hooks, and weels; herrings by means of

---

ish term rendered "long line" is "Bakke." The implement consists in a long line
ter ones are attached at certain intervals; these latter (which are called "snoods"
eing furnished with baited hooks and terminal floats. The term "trawl" was
d for this implement, and is still so used in parts; but is not used here because it
trawl" now generally means "trawl net"—a net dragged along the sea-bottom and
weights.
g nets" stands for "Drivegarn"—nets floating near the surface, or at any rate not
lown near the bottom.
ard" means a set of weels.
aad" is a net dragged along the bottom, but not so heavy as a trawl net.
ad" is a net into which the fish is driven after the net has been conveniently fixed,
surface of the water with a peculiar club-shaped wooden instrument, of which the
s excavated a little. The instrument is driven down against the water with the
foremost. The noise produced can be heard at a great distance, and frightens the
et.
evaad" is a net of which one end is firmly fixed by means of an anchor, the boat being
the latter.
garn" means a net sunk so as to intercept the fish moving along the sea bottom.

Vaad * and Bundgarn; cod are caught in nets and with hooks; flat fish are taken in Vaad or Nedgarn †; lobsters too are fished for here. The value of this fishery was put down as amounting to 450,000 crowns in 1881. Besides this, two millions of oysters are taken annually, to a value of 300,000 crowns.

The *Fresh-water Fishery* of Denmark is of no great importance on account of the small extent of lakes and rivers. The species of fish are those usually occurring in that latitude. The whole value may be taken to be about 150,000 crowns, of which about 60,000 crowns' worth are exported to Germany.

The total annual value of the fisheries in Denmark proper may be estimated at about 5,500,000 crowns, of which 2,300,000 crowns represent the export to other countries, 2,000,000 crowns the value of the fish sold in Denmark, and 1,200,000 crawns the consumption of the fishing population itself

The number of families living principally by fishery is about 4,300; 7,000 families derive subsidiary income from fishing. In all, 11,300 families are connected with this industry. The number of boats employed having decks or wells is about 1,000, besides from 4,000 to 5,000 open boats. The tonnage of these crafts cannot be stated.

The fish exported consists mainly of haddock, flat-fish, salmon, oysters, herrings and eels, the two last kinds either fresh or smoked. By far the greater portion goes to Germany, a smaller portion to Sweden. The fish is conveyed by rail, steamers, or boats with wells.

## B. Iceland.

The proceeds of the cod-fishery in 1882 was estimated at 20,000,000 lbs., and the value at 4,000,000 crowns. The fish is cured in two ways; the so-called "Klipfisk" is exported mostly to the south of Europe, whilst the so-called "Platfisk" or "Stokfisk" forms the principal article of food of the inhabitants. The herring fishery produced last year about 50,000 barrels, value 1,300,000 crowns. Another important branch of fishery in Iceland is that of the Hákal, or Greenland shark (*S. borealis*, Scoresb.), of which the liver yields a great quantity of oil.

## C. The Faröe Islands.

The fishery is of the same description as that of Iceland, and the proceeds in 1882 were stated to be 4,000,000 lbs. of fish, worth 800,000 crowns. In some years a considerable revenue is derived from the capture of pilot whales (*D. globiceps*), large shoals, numbering sometimes as many as 2,000, being occasionally driven on shore and killed.

## D. Greenland.

The native population of Greenland, which on the 1st of January, 1882, amounted to 9,752 individuals, subsist entirely on the chase of marine mammalia and birds, and on fishery. 2,100 kajaks, 2,400 nets, 250 large boats, and 270 sledges, with their complement of dogs, are employed, and the annual take may be estimated at 90,000 seals, 15,000 sharks, besides a quantity of small whales, salmon trout, halibut, and cod.

* "Vaad" means a fishing-net generally, but especially a net which is thrown out from a boat or near the shore and then dragged in.

† "Nedgarn" is a net which does not reach so far down as a "Bundgarn."

## LIST OF EXHIBITORS.

### DANISH METEOROLOGICAL INSTITUTE.

INSTRUMENTS.

*Thermometers—*

Thermometer for measuring the temperature of the surface of the sea.
Isolated Thermometer (in ebonit) for deep-sea temperature (constructed by Steger, Kiel).
Isolated Thermometer (in cork) for deep-sea temperature (constructed by Rung, Copenhagen).
Revolving Apparatus, with Negretti and Zambra's deep-sea Thermometer (Rung).
Rotation Polychrometers (Hoffmeyer and Rung).

*Water-bottles—*

Water-bottle (Arwidsson, Stockholm).
Water-bottle (Rung, Copenhagen).
Weight, to be separated in two (Rung, Copenhagen).

*Hydrometers—*

Case with 6 Hydrometers and Thermometer.

*Anemometers—*

Stationary Anemometer (Hagemann, Copenhagen).
Portable Anemometer (Hagemann and Rung).

CHARTS.

Chart of Denmark Nautical Service, Meteorological Stations (lighthouses, light-vessels, revenue cutters).
Chart of Denmark Weather Service. Stations supplied with daily weather forecasts.
Chart of the North Atlantic, with number of observations, registered from ship-buoys.

MODE OF PUBLISHING DAILY WEATHER CHARTS.

Hectographic Weather Charts.
Weather Charts in Newspapers (Method, Rung).
Copy of "Nationaltidende."
Matrice in paper, for the Victoria Press.
Weather Chart in stereotype, ditto.

PUBLICATIONS, INSTRUCTIONS, ETC.

Annual Reports, Instructions for Regular and Casual Observers, Schedules, &c.

# FRANCE.

The term Maritime Fishery is applied to operations carried on at sea, on the coasts and salt lakes, and also to that of rivers, streams, and canals, up to the limits of the Maritime Inscription.

This fishery is exempt from dues and rents, but it is from among those engaged in it that the State recruits crews for its men-of-war. The fishermen are in this respect included in the Maritime Inscription after having been engaged afloat at coast-fishing for two years or less.

In 1881, which is the date of the last statistics compiled by the Department of Marine, 80,875 sailors, manning 22,125 ships and smacks, with a tonnage of 149,297 tons, were employed in fishing: besides which, 55,485 riparians (men, women, and children) practised fishing on the banks.

The figures above quoted comprise not only the fisheries of the French Coast, but also cod-fishing off Newfoundland, Iceland, and the Dogger Bank, as well as herring and mackerel fishing on the coasts of Scotland, England, and Ireland.

Taken as a whole, the year 1881 was not so productive as the year preceding. In 1880, in fact, the value of the produce captured reached the sum of 86,917,668f. In 1881 only 82,670,058f. was valued.

The diminution, 4,247,610f., may be traced exclusively to the sardine fishery grounds, from which the returns show, as compared with the year 1880, a falling off of six million francs.

The Newfoundland cod-fishery was prosecuted in 1881 by 137 vessels, manned by 5165 sailors, who captured 17,683,289 kilogrammes of fish, realising 7,882,253 francs.

In Iceland the same fishery employed 202 vessels and 3436 men. The take of cod was 9,695,411 kilogrammes, selling for 5,876,607 francs.

The herring fishery was very successful during the season of 1881, 39,101,845 kilogrammes of this fish, valued at 9,055,352 francs, having been captured on the coasts of Scotland, England, and France. It would have been more prolific still had it not been marred by bad weather, which inflicted losses both of men and effects on several vessels.

The fisheries for fresh fish, which comprise turbots, brill, soles, plaice, flounders, rays, gurnets, mullets, whiting, congers, salmon, lampreys, sturgeons, etc., were carried on by 72,274 sailors, manning 21,786 smacks,* and the take was 49,940,025 kilogrammes of fish, realising 32,216,487 francs.

374,985,770 oysters were dredged during the season 1880–81 (*i.e.* between 1st September, 1880, and 15th June, 1881). These fetched 2,061,753 francs. The *total* number of oysters disposed of during the same period amounted to 680,372,736, and the money obtained for them to 17,951,114 francs. This total includes those fished from the sea and those gathered from the artificial breeding grounds or "parks."

The following table shows the number of piscatorial establishments existing on the 31st December 1880 and 1881 respectively. This table also shows the

* In this number are comprised boats engaged in fishing for herrings, mackerel, sardines, anchovies, oysters, mussels, other shell-fish, and prawns, and those employed in special service. These vessels carry on in turn one or other of these different industries.

| ESTABLISHMENTS. | NUMBER. | | | | AREA. | | | | KEPT. | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | Public Domains. | | Private Property. | | Public Domains. | | Private Property. | | By enrolled mariners, their wives and children. | | | | By persons not enrolled. | | | |
| | | | | | | | | | Public Domains. | | Private Property. | | Public Domains. | | Private Property. | |
| | 1880. | 1881. | 1880. | 1881. | 1880. | 1881. | 1880. | 1881. | 1880. | 1881. | 1880. | 1881. | 1880. | 1881. | 1880. | 1881. |
| | | | | | hect. a. c. | hect. a. c. | hect. a. c. | hect. a. c. | | | | | | | | |
| Fishery establishments in permanent structures . | 924 | 935 | — | — | 1487 47 61 | 1491 12 41 | — | — | 578 | 580 | — | — | 3341 | 3353 | — | — |
| Establishments for net fishing . . . . . | 1154 | 1175 | — | — | 106 18 0 | 108 28 00 | — | — | 611 | 615 | — | — | 453 | 468 | — | — |
| Parks, beds, and preserves for oysters . . . . | 30,591 | 32,364 | 957 | 970 | 7734 03 69 | 8050 39 66 | 368 60 76 | 375 69 83 | 10,116 | 10,706 | 115 | 118 | 17,293 | 17,841 | 755 | 766 |
| Mussel beds . . . . | 5356 | 5568 | — | — | 1243 50 00 | 1264 70 00 | — | — | 2325 | 2338 | — | — | 2593 | 2610 | — | — |
| Parks or depots for Mussels | 805 | 836 | 18 | 18 | 136 45 35 | 140 54 98 | 3 60 00 | 3 60 00 | 1356 | 1376 | — | — | 2194 | 2205 | 18 | 18 |
| Tanks or preserves for Crustaceans . . . . . | 83 | 92 | 1 | 1 | 3 76 60 | 12 36 82 | 3 24 | 3 24 | 32 | 36 | — | — | 26 | 29 | 1 | 1 |
| Fish Tanks. . . . . | — | — | 1621 | 1626 | — | — | 1171 48 60 | 1174 19 23 | — | — | 82 | 84 | — | — | 1463 | 1466 |
| "Bordigues" . . . . | — | — | 32 | 32 | — | — | — | — | — | — | — | — | — | — | — | — |
| "Madragues" . . . | 16 | 15 | — | — | — | — | — | — | 1 | 1 | — | — | 11 | 10 | — | — |
| Total . . . . . | 38,929 | 40,985 | 2629 | 2647 | 10,711 41 25 | 11,067 41 87 | 1543 72 60 | 1553 52 30 | 15,019 | 15,652 | 197 | 202 | 25,911 | 26,516 | 2237 | 2251 |
| Increase for 1881 . . . | 2056 | | 18 | | 536 h. 00 a. 62 c. | | 9 h. 79 a. 70 c. | | 633 | | 5 | | 605 | | 14 | |
| Decrease for 1881 . . . | — | | — | | — | | — | | — | | — | | — | | — | |

gradual development of oyster culture, the principal centres of which are found in the 3rd and 4th maritime arrondissements (Departments of Morbihan, Charente Inférieure, La Vendée, and the Gironde).

The Department of Marine endeavours to ameliorate the condition of fishermen. Those among them whose apparatus are lost or spoiled by bad weather receive grants to help them replace their fishing tackle, if they are unable to do so out of their own means. Besides this, the Fund for Disabled Sailors awards help to the families of those who are lost at sea, and in the different ports along the coast there exist benefit societies for fishermen.

In France the maritime fishery is regulated in such a manner as to secure to sailors the free exercise of their calling, awarding to them at the same time financial protection when help of this kind can be usefully given.

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## LIST OF EXHIBITORS.

### Division I.

**Gear of every description and of all nations used in trawl, herring, long line, hand line, and every other mode or system of fishing, including all nets, lines, hooks, harpoons, tackle, &c., employed in the same.**

**DUMONT, CHARLES, & CAPELLE, EDMOND,** 25 Rue du Bœuf & 18 Rue de l'Epée, Dieppe.
Net-irons with handles, weight about 240 kilogrammes.

**GORDOLON, HONORÉ,** Enclos Simonot à Antibes, Alpes Maritimes.
Small Box containing 13 leads for bottom lines, length 28 centimètres, breadth 7 and 4 millimètres.
Long Rod, length about 5½ mètres, furnished with a line suited for all kinds of fishing.

**PERNEL, FRANÇOIS ALEXANDRE,** Vitry-le-François, Marne.
Nets for River and Sea Fishing, with Lines, Weights and Corks complete.

### Division IV.

**BOULOGNE,** La Chambre de Commerce de.
Large Model of a Fishing Boat, and other objects.

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**ANDERSON, ABBOTT, & ANDERSON,**
**37, Queen Victoria Street, Londres, Angleterre,**
Fabricants les plus considérables du Monde des
MEILLEURS VÊTEMENTS EN TOILE VERNIE.
Médailles décernées à toutes les Expositions Internationales.

## DIVISION IX.

### Life-Boats, their equipment, and life-saving apparatus of every description.

**RUNEL, JOSEPH J. B. A.**, 75 Grande Rue de Pollet, Dieppe.
Safety Lines, Portable, and for Permanent Stations.
Since 1874 more than three hundred people owe their lives to the small Brunel lines. The rescued persons were of English, French and other nationalities.

**ELATRE, FRANÇOIS**, 54 Park Walk, Fulham, London.
Model of a Life-Boat for Sea use. Life-Buoy shown attached.

**UVAL, NICOLAS & CO.**, 152 Faubourg St. Martin, Paris.
Patent Life-Boat.

**ATHOUD, JOSEPH**, 19 Anerley Road, Upper Norwood, S.E.

## DIVISION XXVI.

ii. Fish dried, smoked, cured, salted, tinned, or otherwise prepared for food.

**ULLIEN, FIRMIN**, Lorient Morbihan, (Messrs. Lyon & Co., 3 Love Lane, Eastcheap, London).
Sardines in oil.
Tunny and Mackerel in oil.
Sardines *au naturel*, in tins.
Sardines in Vinegar and in Salt.

**GEREAU FRÈRES**, Nantes.
Boxes of Sardines in oil.

**NILLON, FELIX & CARON, VICTOR**, 54 Rue du Finistère, Lorient (Morbihan).
Prepared Sardines with Olive Oil, in tins.

**ENAUROS, GUSTAVE**, Douarnenez, Finistère.
Sardines in Oil, with and without bones.

**AGEANT-RONDENET, & BEUCHET, J.**, Ville-en-bois, Nantes.
Preserved Sardines and various Fish, in cases.

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**ANDERSON, ABBOTT, & ANDERSON,**

**37, Queen Victoria Street, Londres, Angleterre,**

Fournisseurs du Gouvernement anglais des VÊTEMENTS EN TOILE VERNIE pour les Services sousmarin, des Mines et des Torpilles; ainsi que des HAVRE-SACS EN TOILE VERNIE brevetés de leur invention et adoptés pour le Service militaire anglais.

**SANPIGNEL, ARSEM,** Rue Crucy, Nantes.
Preserved Fish in patent boxes.

**SOCIÉTÉ-GÉNÉRALE DES PRODUITS ALIMENTAIRES,** 25 Rue Richer, Paris, and 101 Leadenhall Street, London.
Boxes of Sardines in Oil.

## Division XXXIII.

### Transport and sale of fish.

Appliances for carrying fish and for preserving fish during transport or otherwise, and models of the same.

**PETIT, WILSON, & CIE.,** 287 Rue de Constantine, Boulogne-sur-Mer.
Casks for Fish of every description.
Cases for Preserves, Liquids, &c., machine made.

## Division XXXV.

**Models or drawings of fish-hatching, breeding and rearing establishments, including oyster and other shellfish grounds; and all apparatus and implements connected with the same and for transporting fish and fish ova. Food for fry.**

**CORNILLEAU, LOUIS, (AÎNÉ)** La Trinité-sur-mer, Morbihan.
Apparatus for Oyster Culture.

**D'AVRIN DE PIOLANT, VISCOUNT,** Villa Briançon par Soubise, Charente Inférieure.
Plan (in relief) and design for an Oyster Breeding Establishment in the *seaux* of Marennes.
Oyster Parks, &c.

**DE CORBIGNY, HENRI,** Auray, Morbihan.
Oyster Shells of various sizes from the breeding grounds of Mons. Deboilxguy, from 1 to 9 centimètres.
Boxes, Platforms, &c.

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**Copie d'un CERTIFICAT reçu par ANDERSON, ABBOTT, & ANDERSON relativement aux Collets et Guêtres de Police imperméables fournis par leur maison.**

Bureau du Receveur de la Division de Police Métropolitaine,
4 Whitehall Place, S.W., 21 *juillet* 18[illegible].

COLLETS NOUVEAUX MODÈLES.

Résumé du Rapport des Surintendants quant au service et à la résistance des Collets échantillons portés par les Divisions A, B, C, K, N et R en janvier 1868.

Les Surintendants disent que les Collets sont très supérieurs à l'ancien modèle; qu'ils ont résisté bien, sont imperméables, ne se fendent pas, sont toujours en bon état, et dans la Division R les hommes sont d'avis qu'ils sont les meilleurs Collets dont ils se sont jamais servis. Dans la Division B on croit que le Modèle No. 2 est un peu meilleur du No. 1.

(*Signé*) Thos. Kittle, *Surintendant.*

**ELAGE, VICTOR**, 55 Rue Neuve, Rochefort-sur-Mer.
Plans of Mussel Grounds.
Fascines with the Fish adhering.

**E LAMARZELLE, GUSTAVE**, Morbihan.
Living Oysters. Boxes for Oyster-breeding. The living oysters will be deposited in these.

**EDAN, D., & JARDIN, D.**, Auray, Morbihan.
Plans of Oyster Parks.
Instruments and utensils for use in breeding and rearing grounds.

**MARTIN, ALPHONSE**, Kergurioné, près Auray, Morbihan.
Oyster Shells.
Wooden Platforms with Oyster Spat.
Utensils for Oyster Culture, &c., &c.

**OUGÉ, HENRI**, 13 Rue Neuve, Marennes (Charente-Inférieure).
Baskets used in Oyster and Mussel culture.

DIVISION XXXVI.

**Representations illustrative of the development and progressive growth of fish.**

**ORNILLEAU, LOUIS (AÎNÉ)**, Trinité-sur-mer, Morbihan.
Specimens of Spat. Age from 12 to 18 months.
Specimens ef Oysters 2½ years old.
Tiles furnished with Oyster-Spat, a method adopted for collecting spat from the open sea.
Oysters Reared by Exhibitor.

**ELAGE, VICTOR**, Rochefort-sur-Mer.
Oysters—Collections from Various Establishments.

**E LA RICHERIE**, 4 Rue Cale Ory, Lorient, Morbihan.
Oyster Shells of different ages and sizes, reared in the breeding grounds of Kergroise en reede, Lorient.

**RESSY, DR., & EZANNO, E.**, Carnac. Morbihan.
Tiles furnished with Oyster-Spat of different sizes, dead, but can be had alive if required.

NDERSON, ABBOTT, & ANDERSON,
MANUFACTURERS OF THE BEST
ILSKIN CLOTHING FOR SEA AND LAND PURPOSES;
Also Oilskin Horse Clothing, Cart and Rick Covers, and their Celebrated Patent Waterproof Cloth for Covering, Driving and Carriage Aprons, &c., &c.
(*Copy of Testimonial.*) HOME OFFICE, *Sept.* 3, 1878.
Messrs. ANDERSON & Co.—You made me an Oilskin Coat about seven years ago, which has lasted in capital condition until this year. (Signed) A. F. O. LIDDELL.

**HEDAN, L., & JARDIN, D.**, Auray, Morbihan.
Oysters of all Ages and Sizes.

**LEROUX, HENRI (DR.)**, Sables d'Olonne, Vendée.
Illustrations of Oyster Culture.
Living Oysters in Sea Water.

**POZZY, M.**, Morbihan.
Oysters of all Ages and Sizes.
Tiles of Spat.
(The whole dead and in a dry state.)

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DIVISION LX.

**Reports, statistics and literature of fish, fishing, and fisheries.**

**BOUCHON, BRANDELY J. B.**, Collège de France, Paris.
Works relating to Fishing, Fish-Breeding, and Oyster Culture.

**GRAND, SIMON**, Marennes, Charente Inférieure.
Pamphlet on the Oyster Industry at Marennes.

**RAVERET-WATTEL, CASIMIR**, 19 Rue de Lille, Paris.
Ichthyological Chart of France.
Provisional Map of the World, showing the Geographical Distribution of various Food Fishes.

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**ANDERSON, ABBOTT, AND ANDERSON,**
**Contractors to the English Government for OILSKIN CLOTHING, as worn for Submarine, Mining, and Torpedo Works; also for their Patent Finish OILSKIN KIT BAG, as introduced by them, and adopted for the British Army.**

# GERMANY.

There are many advantages in the geographical position of the German Empire which considerably favour fishery and its cultivation. The vast extent of the south coast of the Baltic, with its multitude of useful fish, which abound still more towards the south-west, wholly falls within the limits of the German Empire, while the coasts of Schleswig-Holstein, Hanover, and Oldenburg afford a considerable seaboard on the German Ocean.

The wide estuaries (Haffs), covering an area of 401,956 hect., and formed by the great rivers which flow into the Baltic, combine the advantages of both salt and fresh water, and thus greatly contribute to the success of fishery.

The country may be divided into six large river districts, created by the Rhine, Danube, Weser, Elbe, Oder, and Vistula. In these rivers, and their numerous tributaries, every variety of flowing water is to be found, from mountain rivers and torrents replete with all kind of salmonoids down to the sluggish streams in the plains, with their multitudes of valuable cyprinoids. Along the southern boundary of the empire, the Alpine slopes have formed that group of mountain lakes which by their matchless beauty delight every tourist, yet, however important these may be on account of their extent and the abundance of fish they contain, they are surpassed in importance by the endless number of lake-like formations to be met with in the eastern portions of the plains of Northern Germany, partly isolated, partly connected with each other, or with neighbouring rivers; these lake-like formations are of the highest value for the purposes of fishery. The river Drewenz (to take a single example), which is 200 kilometres in length, connects 123 lakes of this description in its course through East and West Prussia, whereby the migration of fish is greatly facilitated. The area of these lakes exceeds 20,000 hect., and the fauna of the combined sea and river system comprise salmon, sturgeon, trout, grayling, smelt, the small maraena, perch-pike, pike, perch, pope, lamprey, and of the large tribe of the cyprinoids, carp, tench, dace, barbel; finally large numbers of eels, and particularly fine crayfish.

It must be understood that this district is not exceptionally favoured by piscatorial advantages; on the contrary, the percentage of the area occupied by these waters to the total area of the district will show that their extent is not above the average area covered by water in other parts of the empire. The average percentage in the seven eastern provinces of Prussia is 4·3: in the provinces of East and West Prussia alone it is 7·4, in Posen 2·0, in Brandenburg 3·0, and in Pomerania 7·7.

These natural advantages must have led the people of Germany to take up fishing at a very early period. Indeed pre-historic discoveries have brought to light surprising facts, which show how closely connected with the dawn of civilization was the practice of fishing. With the advent of historic times, we find in records, statutes, names of towns, escutcheons, and many other things, increased testimony that fishing was a highly important factor in the economy of the nation. The history of later periods brings to light facts such as these, viz.: that fishery was to a great extent the source from which the Hanseatic league derived its power, and by which its commercial instincts were encouraged; that the German Order during its colonizing efforts in heathen Prussia, bestowed a care and skill on the regulation of fishery in many respects worth emulating even at the present day; and that the people felt so keenly the gradual restric-

tions and alterations in the original right of free fishing, that the claim for the restitution of this right occupied a prominent place in the programme of the great social movement, which agitated the peasants in the sixteenth century.

In the following centuries the cultivation of fishing, in common with national economy generally, suffered a great relapse, which for a long time retarded an advance from mere promiscuous fishing to that more methodical system which aids nature, partly by trying to increase the stock of fish, partly by making proper and rational use of them.

It is only very recently that the sense of the advantages of this system has returned, and at the present moment fishery associations are established in all the Confederate States of Germany, foremost among them being Prussia. These associations, which are uniformly supported by the German "fischereiverein," and a daily increasing number of private fish-breeders of experience, vie with each other in performing their task.

The beginning of this movement dates from the Prussian Fishery Laws of 1874. Although difficulties of no ordinary kind stood in the way of legislation on this subject, yet the legislator, backed by the unanimous verdict of all parties entitled to express an opinion as experts, has attained his object.

A diversity of views exists as to the provisions of the provincial fishery laws passed on the basis of the general law above cited. A special subject for criticism has been the principle newly introduced by these subsequent laws of an *absolute* close time, i.e. an annually recurring period during which not only are restrictions imposed on the capture and sale of specific classes of fish, but during which all fishing operations are prohibited in certain waters, or parts of the same. In whose favour the balance of opinion will at length turn; whether the new principle will prevail, or whether the old system of enforcing a close time for certain species will be resorted to, cannot at the present time be predicted; but it is certain that the ultimate decision will guide the course of legislation in the other German confederate states. The desire of a uniform settlement of fishery questions, in conformity with generally accepted views, is a strong one throughout the empire, and is shared by the different governments.

Statistics have not been able to keep pace with the rapid progress that fishing has made in late years. Many of the statistical data collected in former years have now become antiquated, and are no longer in accordance with the actual state of things. To cite these data without commentary, for which there is no room in this paper, would obscure a clear survey of the subject. This applies even to deep-sea fishing, which is naturally carried on under more stable conditions. Suffice it therefore to state that the German fisherman is again becoming accustomed to look beyond the narrow field of operations afforded by the coast, and to push his ventures farther into the open sea. His endeavours to show greater energy than hitherto are actively furthered by the State, especially in the case of Prussia; vessels better suited for the purpose are built; fishery associations are encouraged; the network of railways is being extended for facilitating a rapid supply to the interior of the country; tariffs have been reduced, new contrivances for transporting fish invented, harbours of refuge constructed for the fishermen; everything in short has been done to enable them to carry on their business steadily and without interruption.

A satisfactory settlement of the question of the Berlin Market Halls, which may be looked for now at an early date, will act as a powerful lever in the encouragement of deep-sea fishing.

It is, however, true that much is still to be desired as far as the consumption of fish is concerned. The widely entertained prejudice against the consumption of

fish not brought alive to the market is a great obstacle to a reduction in price, and one which mainly prevents a larger consumption by the lower classes.

The supply of sea fish and fresh-water fish, uncooked or prepared for consumption, remains in the country, and is insufficient to meet the demand. Only in those Prussian provinces which border on Russian Poland is a brisk export trade across the frontier carried on. It is right, however, to state that the export, principally from Berlin, of crayfish to France and Belgium has assumed extraordinary dimensions. The number of crayfish annually exported from that city is estimated as being at least thirty millions.

Among the means of improving inland fishery, artificial fish-breeding has acquired a foremost place. Originally a German invention of the eighteenth century, it has been improved upon by other nations, and in its new shape has now become firmly established in all parts of Germany. The German "Fischereiverein" has made this system a basis for all its exertions, and consistently abides by the principle which it has laid down in the two following sentences—

"An jeder Mühle muss wenigstens ein Kalifornischer Trog arbeiten;" * and;

"Ueberall in das rechte Wasser der rechte Fisch." †

Consequently an animated circulation of different species of fish is carried on throughout all parts of the country; the perch-pike and maraena are translated to the west and south; the eel and salmon are to try to acclimatise themselves in the Danube; the Alpine lakes enrich those in the eastern low-lands with trout and coregonus of the best breed. The indigenous species are being augmented by imports from abroad, especially by various American salmonoids. At the same time natural breeding retains its place. Experiments with multitudes of naturally-bred young cyprinoides are more and more resorted to and promise good results.

The cultivation of ponds, which sank from a highly flourishing state in the Middle Ages, after the abolition of monasteries, is now recovering the ground it lost; and the carp—to mention this fish only as an instance of the direction now given to pisciculture,—is shown the way of improving his species by the introduction of carefully selected kinds from other localities.

Germany, though somewhat hesitatingly at present, is following the example of England in endeavouring to render rivers again passable for migratory fish, and the problem, how to prevent the pollution of rivers more effectually than hitherto, without encroaching upon the lawful interests of other industries, is now occupying learned as well as unlearned heads.

One thing unfortunately is yet in the initial stage of its development—the sport of angling. This kind of sport, at least when viewed from a sportsman's standpoint, is a thing almost unknown; for the public are mistaken in assuming that what is commonly practised in Germany as the art of angling, is the genuine prototype of this noble art. Much of its decline may be attributed to shooting, which in Germany especially is such a powerful rival to other forms of recreation, Nevertheless signs of an improvement in this respect are happily discernible, more particularly in Southern Germany, where the votaries of genuine angling are daily on the increase. The time may not be very far off when the German sportsman, jostled by a throng of fellow-devotees, will with some sadness look back upon the day when he with his fishing-rod was the lord of boundless and magnificent tracts of water.

* "A Californian hatching-box must work at every mill-dam."

† "Above all the right fish in the right stream."

## LIST OF EXHIBITORS.

### Division XXXII.

### Preparation, preservation, and utilisation of fish, a forms of life included in Class V.

iv. Preparation and application of sponges, corals, pearls, shells, parts and products of aquatic animals, &c., to purposes useful and orn with specimens.

**MANN, ISAAC,** 114 Chaussée Strasse, Berlin.
12 Slips of Whalebone.
10 Slips Straight Arctic Whalebone.
10 Slips Curved Arctic Whalebone.
50 Bundles of *Suckers Whalebone.*

**STOCK, H.,** of Ulm. (Messrs. Atkins & Nisbet, 1 Water City, Agents.)
11 Pattern Cards of Lines.
1 Tackle Case in hard wood.
2 Fly Cases.
31 Metal Fish.
1 Bait Can, green, small size.
1 ditto, green, larger size.
1 ditto, yellow, small size.
1 ditto, yellow, larger size.
1 Anglers' Pouch.
1 Anglers' Case, with compartments.
6 Show Cards of Prepared Silk Lines, waterproof, intend anglers to try and test the quality.
1 Fly Rod.
1 ditto, Houart, with 2 reserve joints.
1 General Rod.
1 Leather Covering for Fly Rod.
1 ditto, for Houart Rod.
1 ditto, for General Rod.

### Division LX.

### Reports, statistics, and literature of fish, fishing, a fisheries.

**THE BAVARIAN FISHERY ASSOCIATION** (Baye Fischerei-Verein).
"Guide to Angling" (Anleitung zur Angelfischere Wilhelm Bischoff.

# GREECE.

The fisheries of Greece, on account of the number of persons who gain their living by this trade, hold a prominent position in the country. But these products, barely sufficing for the daily consumption, do not influence foreign trade. However, in the smallest ports there are some fishing-boats which practise fishing either by the net, drag-net, or line. The population living by fishing is rather large, but we do not know the exact figure, having no official documents on this point.

There are in Greece twenty-four establishments for pisciculture, which are the property of the state. The lease of these establishments is put up for auction by the public treasury every ten years. The best of these establishments are installed in the lagoons, which extend over a space of more than 30 square kilomètres, in front of the town of Missolonghi. Two-thirds of the population of this town earn their living by fishing, and above all by a kind of pisciculture, that is, retaining the fish in the lower lakes by an enclosure, and afterwards capturing them just at the moment when, eager to spawn, they seek to regain the open sea. The weight of the fish thus reared, and afterwards caught, amounts to more than 600,000 kilos. a year. The fish are sold fresh in the market of the same town, or that of the neighbouring town, Patras (Achaia). The preparation of salt fish is only carried on on a very small scale. The best and most appreciated product of the country is the *Boutargue*. What is thus designated consists of ovaries full of the mature eggs of the *Mugil Cephalus*, salted and afterwards dried by exposure to the air. In three ports of the country, Corinth, Chalcis, and Oræoi, they practise, especially in summer, the Sardine, Anchovy, and Scomber-mackerel fishing—fish that are here always salted. Last year was very unfavourable for this fishing, and it was with difficulty, even in the three above-mentioned ports, that they could muster a thousand barrels of salt fish of 40 kilos. on an average. This fishery has supplied the trade with more than 10,000 barrels. Last year a hundred boats, manned with crews amounting to three hundred and fifty men, scarcely knew how to employ their time.

At Spezzia one hundred and fifty men, manning twenty-five boats, towards the month of May devote themselves to the Tunny fishery by means of a net expressly made for this kind of fish, of which the produce amounted to 7000 kilos. in the last cruise, which was sold fresh in the market of Nauplia at the rate of fr. 1·50 per kilo. This fishery, owing to the number of persons engaged in it, is rather important, and it is to be hoped that it may be introduced to other parts of the coast. The fish that chiefly supply our markets are the red gurnet (*Mulus fuscatus et barbatus*); the (*Dentex vulgaris et macrophthalmus*); (*Chrysophrys aurata*); (*Pagellus erythrinus mormyrus*); smarides (*Smaris vulgaris*); mullet *Mugil cephalus, capito saliens labio chelo et curtus*); whiting (*Merlangus pontasson*; *Merlenius vulgaris*); (*Golius gojo niger auratus, etc.*); (*Epinephelus gigas*); (*Labrax lupus*); (*Lichia glamus*); sardines and anchovies; (*Lalpa box*), &c. &c., and others in smaller quantities. Not having great fisheries in the country, we have no laws or special rules respecting them. There are laws, however,

for the protection of the young fish, prohibiting the use of certain machines, and above all the drag-nets and seines (*pêche dite au bœuf*), and the use of narcotic plants deleterious to fish, such as the *Verbacum sumatum*, L. and the *Euphorbia dendroides*, L., as well as explosive materials. The fishermen are subject to all the sanitary laws, and rank in the class of coasters; they are thus under the protection of the law and the treaties, provided that the coasting-trade and the fishing are licensed Hellenic citizens. There is, in Greece, another maritime industry, which cannot be separated from fishery properly so called; it is the sponge fishery which provides nearly all the world with these articles of domestic use. This fishery is practised in three different ways, by diving apparatus, by harpoon, and lastly by single divers. Five ports in Greece exclusively furnish all the sponge fishermen. They are the ports of the Island of Egina, Hydra, Hermione, Kranidi, and Trikéri.

Of the boats employed in this fishery, 183 are used for the diving apparatus and 540 for harpoons and divers. Their crews form a total of 3160 souls.

Fishing is principally carried on in the Ægean Sea, in the canal of Crete, and near the coast of Africa (Barbary and Tunis). The finest sponges are found in Grecian waters, particularly by the divers.

The produce of this fishery increased last year to about fr. 2,400,000. The sponges are sold principally in France and England.

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## COLLECTION PREPARED BY THE MINISTER OF THE INTERIOR.

### Class I.—Section I.

### FISHING.

[SEA FISHING.]

### Division I.

**Gear of every description and of all nations used in trawl, herring, long line, hand line, and every other mode or system of fishing, including all nets, lines, hooks, harpoons, tackle, &c., employed in the same.**

Seine Net (γρῖπος model).
Ditto, but made to drag along the bottom (γριωαρόβι).

Specimen of Net for Mullet-fishing.
Specimen of Circular Net for Mullet-fishing (πεζοββοος).

### Division II.

**Oyster dredges, crab, lobster, prawn, &c. Pots and other appliances for catching fish of this description.**

Traps "Haveneaux à bascule," employed in lobster-catching.

Special traps, "Haveneaux," used for catching the "gar-fish."

Παράπατος, an appliance for catching cray-fish in the river Peneus.
Three Appliances, "Haveneaux balances," for catching shrimps.
Basket, made of reeds, with two special Traps, "Haveneaux" (βολκοί) for catching eels. Full-sized model.
Basket, with complete set of Lines of 400 hooks each, together with all accessories (παραγάδι).
Bell-buoy used with the Lines on dark and stormy nights.

Two Water-melons, used for buoying lines.
Basket, containing specimens of lines of different sizes.

Buoys for Lines.
Line for Seine Net (συρτή) used in fishing for "Dentis" (Dentex).
Ditto, (συρταρόλι) used in fishing for Chad, or Horse-mackerel (Trachurus).
Special Line, furnished with all accessories, used in fishing for Stone Bass or Wreck-fish.
Iron Ring, for disentangling lines caught among rocks.

Line (ὁρμιὰ) for large fish.
Ditto (ὁρμίδι) for small fish.
Special Line, used in fishing for Stone Bass, attached to a stick.
Special Line, employed in fishing for the "Oblata Melanura."

Four Lines, made of horsehair, specially employed in fishing for "Bagues."
Perpendicular Line (καδετή), specially used in fishing for the "Serranus" (χανικό). Made of horsehair, and wound upon a piece of carved wood.
Ordinary Fishing-rod, in four parts; with line.

Bow-nets, specially employed in Mullet-fishing.
Two Large Corks prepared for the "Oblata Melanura" fishery. (φελλάρια).
Two imitation Cuttle-fish in wood (ξυλοσουπιά and σπιγάλι), used in catching the same.
Three Conical Bow-nets specially used for mullet-fishing, at the piscicultural establishments.
Special Appliance employed for catching the Marena.

Special Line (καλαμαργιέρα) employed in fishing for Calmars (Loligo vulgaris).
Another Line specially used in fishing for the "Sepiothenthis" (θάψαβα).
Appliance for detaching the bivalve "Pinna nobilis" from the bottom, together with specimens showing the size of the mollusca thus obtained.

Brasier, to hold the fire lighted in the bows of the boat during night-fishing. Πυρία and πυροφάνι.
Hook used for detaching Cuttle-fish from the rocks.

Appliance used in fishing for Sea-urchins.

Two Special Appliances used in fishing for Cuttle-fish.
Conch, made to serve as a speaking-trumpet.

Haveneau, termed a "Lazare," with accessories; used in shrimp catching
2 Harpoons used in fishing for "Gilt-head" (Chrysophrys).

A full-sized Fishing-boat, similar to those in daily use at the piscicultural establishment of the town of Missolonghi.

A large Pair of Scales (σταφνοκάρι), full size, composed of eight pieces of wood, a square net, &c.
Reed Screens, by means of which a model fish-pond may be constructed similar to those in use at Missolonghi.

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## Class III.

## COMMERCIAL AND ECONOMIC.

Preparation, preservation, and utilisation of fish, and all

### Division XLIII.

(b) Sponges, in their natural state.

From Messrs. H. Marks & Sons—
A collection of Sponges taken in Greek waters.

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## Class VI.

## HISTORY AND LITERATURE OF FISHING—FISHERY LAWS—FISH COMMERCE.

**eports, statistics and literature of fish, fishing, and fisheries.**

### Division LX.

**postolides, Nicolas Ch. D.Sc. (Paris).**
"The Fisheries of Greece," a work on Ichthyology, and containing descriptions of fishing appliances, methods, and products, including also Fisheries Statistics and Legislation. 1 vol., 90 pages, published at Athens, 1883.

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**OMMUNE OF SCIATHOS.**
Samples of Materials for Sails.
Model of a small Fishing-boat, furnished with all fishing appliances.

# HAITI.

[*Up to the time of going to Press with the First Edition, the Official Introduction to the Exhibits from Haiti had not been received.*]

DIVISION II.

**Oyster dredges, crab, lobster, prawn, &c., pots, and other appliances for catching fish of this description.**

Osier Fishing Net.
Osier Fishing Net for crabs and lobsters.
Osier Fishing Net for crayfish and eels.

DIVISION IV.

**Fishing craft of all nations; models and representations of the same.**

ii. Fishing vessels and boats other than steam vessels.

Fishing Canoe hollowed out from the trunk of a tree.

DIVISION XLIII.

**Specimens living (marine and fresh water), fresh, stuffed or preserved, casts, drawings, and representations of—**

(*b*) Sponges, in their natural state.

Sponges.

DIVISION XLIV.

(*c*) Corals, in their natural state, polyps, jelly-fish, &c.

Corals.

DIVISION XLVI.

(*e*) Mollusca of all kinds, and shells not included in Class III.

Mollusca.
Shells.

DIVISION LI.

(*k*) Fish of all kinds.

Living Fish.

DIVISION LII.

(*l*) Reptiles, such as tortoises, turtles, terrapins, lizards, serpents, frogs, newts, &c.

Land Tortoise (small). Sea Tortoise (small).

# HAWAIIAN ISLANDS.

## E FISH AND FISHERIES OF THE HAWAIIAN ISLANDS.

ian Archipelago, otherwise Sandwich Islands—a portion of the great area—are eight in number, not reckoning some small rocky islets tween 18° 55′ and 22° 15′ N. lat., and 154° 42′ and 160° 32′ W. lon. a is volcanic, and they rise from an elevated plateau in the Pacific, lepth of 1000 fathoms of water above its floor. Their shores are by numerous species of fish and marine animals, and were formerly whales. Sharks abound, and are caught in numbers by the bold and atives, whose habits are very amphibious. They seek the shark in aves below-water, whilst the gorged fish sleeps with its head forced es of its resting-place. The diver slips a noose round the tail of the h is then hauled up and despatched. A *kanaka* has been known to his manner six or eight sharks in a day. The oil extracted from uable and of good quality. The fish used for diet consist principally let, the most delicate of all, the albicore, the bonito, the flying-fish pecies of mackarel, and the cuttle-fish. The two curious inhabitants eps, the *Chalcedon imperator* and the *Zeus ciliaris*, are figured by ey in her 'Voyage in the Sunbeam.' Of crustaceans there are crabs, d shrimps; and of molluscs, the pearl-oyster, or rather *Mya*, and ll-fish, but the common oyster is not found there. There was formerly in pearls, but they were not of large size, or fine quality, and the them now is almost or quite given up. To a people whose diet concipally of vegetable substances, fruit and fish, the preservation of the fter capture, was an important object. The double canoes, in old times , had between them a vessel or basket for containing the living fish. s enclosed from the sea by a wall, somewhat similar to the *viviers* on coasts, abounded, some of them being of very great size. Numbers nds still exist in the estuary or mouth of the Pearl River. The fished by some of the Hawaiian kings were really gigantic works. Of ine creatures, large quantities were taken of the *bêche-de-la-mer a*, or sea-slug). When dried it formed an article of export, the eing its principal consumers. The Hawaians are not now so greatly on the sea for food, since the introduction of cereals and foreign consumption; nevertheless, in places near the sea, *poi* and fish—the a eaten raw—form the staple of their diet. To an essentially littoral e agriculture of the sea" is a subject of very great importance. Lady marks ('Voyage of the Sunbeam'), that "almost everybody they saw -dozen or more brilliant members of the finny tribe, wrapped up in n banana leaves ready to carry home."

scary laws and customs were severe and rather complex. The absolute of the kings, the arbitrary power of the chiefs, and the extraordinary *abu*, pressed heavily on all Hawaiians, and especially those who dwell

on or near the coasts. Yet there was a certain degree of reason in those laws and the manner in which they were used. The king had universal rights in his feudal dominions, and was lord of the land and sea; but he did not always and everywhere exercise those rights, and the customary laws were not altogether unfitted for the state of society then prevailing. As the Hawaiian people, early in the present century, emerged into the light of civilisation, the monarch generously put aside his feudal rights, and fashioned his government on the constitutional pattern. In 1839 he signed a bill of rights, and in 1840 conferred a constitution on his people. Statute laws soon followed; the first volume which contains them is dated in 1846. The regulations relating to fisheries are very precise. To the king were reserved certain royal fish, wherever they were caught; some had limitations. Thus the bonito was his if taken off any part of the coast of the island of Lanai; the albicore, off Hawaii; the mullet, off Huleia; the squid and freshwater fish at Mana on Kauai. Many other fish are specified in the prerogative, but as only their native names are catalogued, they fail to be recognised here. The king was entitled to one half of the take of these fishes. Then there were the rights of the landlord of the soil and of the sea as far out as the reefs. On his private or prohibited fishing-grounds he could reserve one species as his peculiar property. Provision was made against the fish of the king and the landlord becoming intermingled; in which case the former received two-thirds as his share, but this only in certain localities. No fish might be taken during the *tabu*. When it was announced by proclamation that this season was over, the people might take "protected" fish on their delivering one-half to the appointed agents of the king. He had vast *viviers* which had descended to him, or which he had himself constructed. Most of the islands are surrounded by a reef. Outside the reef there was free fishing for the natives. Within the reef, the littoral and riparian landowner had rights extending to the reef, or in places where no reef existed, his property in the waters went out one mile from the beach. Generally the proprietor named one species for his own, and let his tenants and others take what they could of the rest. The *tabu* acted at proper seasons for the preservation of the fish quite as effectually as the restrictions of our close months do on the fisheries of our own country. The landlord having chosen for the entire year the species or variety of fish he set apart for himself, has to give notice by *vivâ voce* proclamation to the tenants and other persons residing on his lands, and to signify the same to the Minister of Interior in writing. Also a list of all the fish appropriated by the landlords is to be inserted once in English and Hawaiian, in the Polynesian newspaper. When the article relating to the royal fishing rights is invaded, the offender is, on conviction, to forfeit all fish found in his possession; and, in addition, to pay five-fold for all fish taken, or to be put in confinement at the discretion of the court.

As to trade, previous to the last half century the Hawaiians had nothing that might claim the name of commerce. They sold or bartered pigs and fowls, fish and vegetables to the vessels which, few and far between, refreshed themselves on their shores. A transient trade had, indeed, existed with the Chinese in sandal wood, insomuch as that Hawaii was known in China as the Sandal-wood islands. But this source of profit came to an end by the reckless cutting down of the trees. Later on salt was made on their shores, and in 1870, 2513 tons were exported, but in 1881 the quantity had diminished to some 500 tons. About [illegible] years ago a new and profitable but demoralising industry sprang up, namely, the landing and transhipping of oil in the group. The whaling vessels of the Pacific and the tranships called there, and more than three hundred visits have

d in a single year. These had to be supplied, and money and h became abundant. The first whale ship belonging to Hawaii was the year 1834. A record of the oil and bone landed and unshipped e year 1851, the following quantities, viz.;—Sperm oil, 104,362 le oil, 909,379 gallons; whalebone, 901,604 lbs. The trade culmi- year 1858, when there were of sperm oil, 222,464 gallons; whale oil, llons; bone, 1,614,710 lbs. The trade then declined, so that in the records only, sperm oil, 37,812 gallons; whale oil, 312,305 gallons: ; lbs. The whales in the nearer ocean had, in fact, been over-fished, nged their habitat to more distant grounds. This was the result of rovidence which had ruined the sandal-wood trade, and is in other ying india-rubber and other natural productions. A few whalers casionally at Honolulu, and in 1880 are reckoned, among domestic 32 gallons of oil, and 10,917 lbs. of bone.

in agricultural industry, however, more than compensates for the e sea. The export of sugar from the islands in 1882 was 51,000 1,000 gallons of molasses; 5400 tons of rice and paddy, and other n smaller quantities were also exported.

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*ne of going to press with the First Edition, the List of Exhibits for the Hawaiian Islands had not been received.*]

# ITALY.

## I. Introduction.

Owing to the time and space conceded, this must be considered merely condensed essay on the subject.

Italy cannot be said to possess any of the grand fisheries and exte cultural establishments of Northern Europe; our seas are numerically species, but far less so when the number of individuals of import fishes comes to be considered; and our fresh-water fish-fauna is certain game-fish, while our rivers are relatively few and small. It must, ho borne in mind that the fisheries of few countries, and of none in Europ such a variety as those of Italy.

A vast amount of information on the subject is contained in the volumes, "*La Pesca in Italia*," edited by Professor A. Targioni Tozz published by Government (Ministry of Agriculture, Industry and C between 1871-74. The matter contained in this publication was p collected by local committees, in order to bring together the informati sary for the compilation of a uniform fishery legislation. The first thre are dedicated to sea-fisheries, the two following to freshwater-fishe arrangement of the contents, owing to the special object in view a quently to the system followed in collecting the materials, is somewhat and inevitable repetitions occur; yet the amount of most valuable in on the former fishery legislation, local privileges and traditions; on fisheries, nets, implements and boats used; on the social condition, ma customs of fisherfolk on the different parts of the Italian sea-coasts, lago and rivers; and the number of documents, edicts, &c., some of special value on the subject, collected, is very great. Professor Targioni Tozz lished besides a condensed, but yet lengthy, report on Italian Fisher Introduction to the Official Catalogue of the Italian section at the Ber national Fisheries Exhibition in 1880 (*Esposizione internazionale di Berlino*. Sezione Italiana. *Catalogo degli Espositori e delle cose e* xvii.-cxxxvi. Firenze, 1880). Besides, different reports on special have been published from time to time by Government. From these sources I have collected much information, without which my task wo been no easy one.

## II. Fishery Legislation, Past and Present.

As a natural consequence of her long political division, few countr quite a recent date, presented such a varied and large amount of ed and regulations relating to fishery, some dating back to the earlier p Middle Ages, as Italy. A large series of big volumes would be required the documents relating to past Italian fishery legislation, and a varied an collection it would prove, interesting besides as bringing down to our of the piscatorial traditions of the ancient Greeks and Romans, curio linguistic point of view as a medley of corrupt Latin, mediæval Italian and local dialects. I may quote amongst the more remarkable of s

innumerable decrees of the Republic of Venice, relating to fishery and
e, in the lagoons and *valli*. One of the earliest bears the date
ist, 1314; and the curious Red Book (*Libro Rosso*), regulating to the
etails all fishery matters of the inner sea (*Mare piccolo*) of Taranto,
es positively further back than the fourteenth century. Many such
were originally emanated to establish feudal rights, which afterwards
e heirlooms of municipalities or devolved to the State.
he earliest periods of any social status, piscatorial and maritime
ve been much mixed up together, and fishermen and sailors regulated
al laws; on regaining her liberty and completing her unity, Italy
the first place to render as much as possible homogeneous and uniform
legislations up to that period regulating the status of the different
e country now brought together; the promulgation of the Civil Codex
kingdom of Italy was shortly followed by that of the mercantile
in this last was clearly established that while all the disciplinary
s relating to fishermen and fishery along the sea-coasts, more especially
of the maritime conscription and registration of boats, was to depend
ntral naval administration (Ministry of Marine), all that related to
ny of fishery was to depend on the Ministry of Agriculture, Industry
erce. On the other hand, in the case of freshwater fisheries, the latter
as brought in contact both with the Department of the Interior and
of Public Works.
me the laborious task of collecting all the necessary materials for a
d general Law on Fishery; it was the labour of several years, during
bour masters, chambers of commerce, provincial and municipal depu-
ecial, local, and a central general committees, worked away with a will.
was the present Fishery Law, which bears the date of 4th March,
onsists of four chapters and twenty-four articles, and is drawn up in a
rit. Much more difficult was the compilation of the bye-laws or regu-
essary for the administration of the new law; a first general committee
nstructions for such regulations, a draft of which was submitted to
l committees, and the results of the work of the latter brought before
ral committee, composed of competent persons, who finally formulated
tions for Sea and for Freshwater Fisheries, promulgated on the 13th
880. The regulation for sea-fisheries consisted of ninety articles
to six chapters, that for freshwater fisheries of thirty-five articles and
ers. Local wants and special cases had been carefully provided for,
y liberal spirit pervaded the whole; yet, on application, many serious
arose, often where least expected: protests and petitions came in
ent parts of the country, relating to several articles of the new bye-
more especially directed against the restrictions placed on trawling.
ent *Consultive Fisheries Committee*, composed of competent persons—
of parliament, professors of zoology, and government officers—had
been named by royal decree; to this committee devolved the task of
the objections to and petitions regarding the new fishery regulations,
f providing for special cases that had been overlooked or not sufficiently
for. Much labour was got through by single members and in
eetings of the Fisheries Committee, and the results were *classochely*
gulations both for sea and freshwater fisheries; the two other species
ed on the 13th of November, 1882, appears to have the rarities.
nost fishermen, and to guard sufficiently the Mediterranean and Adriatic
ed as food; I need only except:

gation of the more important species of food-fishes. It consists of ni
articles divided into six chapters. The new regulation for freshwater fi
now ready.

Such is a very summary account of the actual state of fishery legis
Italy.

## III. Sea-Fisheries.

### *A. General.*

1. *Fishermen.*—Not everywhere along the Italian seaboard do fisherm
other parts of Europe, form a separate and well-defined class; the reaso
must be sought in the comparative small importance of special fisheries,
the Mediterranean and in the Adriatic. Along many miles of our coast
is done in a desultory manner by old men, women and children, who
other sort of work besides, while the able-bodied men are away at s
workers in naval yards or elsewhere; in some localities the inhabitant
fish at all. But exceptions also exist, and one of the most remarkable
that of Chioggia near Venice, where the entire male population, except
is engaged in fishery, and passes a large portion of the year away fro
down the Adriatic to the Ionian islands. On the southern Italian c
the Mediterranean fishing populations are also met with, and as ex
so may be quoted the inhabitants of the Ponza Islands, Ischia, Faro (M
Trapani and Taranto. As a matter of course, special fisheries are usuall
hands of special classes of fishermen, as those of the thunny, anche
precious coral.

2. *Boats.*—A bare enumeration of the different kinds of boats used
fisheries along the coasts of Italy would fill up many pages; I shall t
merely mention the commoner classes. The first comprises the small
known by the names of *battelli*, *barche*, *gozzi*, *schifi*, and *schifetti*; they
capacity from half to four tons, in length from six to twelve metres, ar
but not decked, carry oars and a small mast with a lateen sail, and a s
(*pollaccone*); they are only used at a small distance from the sh
minor fisheries and do not carry generally more than four or five men.
second class may be included larger boats, from five to sixty tons
completely decked and carrying from five or six to ten or twelve me
have usually two masts and carry at least three sails, one a big lateen.
boats can perform pretty long sea voyages, and often go for fishing purpo
considerable distance; there are many varieties of this larger sort of
boats, but the most notable are the singular *Bragozzi* of the Adriatic, r
able for the shape of their hull and their strange sails coloured in le
deep red and covered with quaint figures and strange devices; next co
*paranze* or *paranzelle* of the Mediterranean, far less showy and charac
These boats generally work in pairs and mostly use trawling nets.

3. *Fishing Implements.*—The number and variety of these is very gr
rendered apparently more so on account of the different terms used for th
the de[illegible]lement in different parts of the country, so much so that at one of the p
collection [illegible] of the Fisheries Committee the writer proposed a resolution, wh
of the piscatori[illegible] Government to have a synonymical and descriptive list of
linguistic point of vie[illegible]illitate the application of legislative measures.
and local dialects. I mi[illegible]any kinds, but may be classed in two principal
[illegible] nets (*reti da posta* and *reti da strascico*).

uite out of the question that I should here enter into a concise description even f the principal varieties. I can merely state their names. To the first series elong the following:—*Manaida*, *Manaidozza*, *Signorella*, *Vollaro*, *Mugginara*, *Tramaglio*, each having special varieties according to the species of fish for whose capture they are used: thus there is a *Manaida* for anchovy, another for ardine, a third for *Atherina*, a fourth for Pelamid, and a fifth, called *Squadrara*, or small sharks and angel fish (*Rhina*). Besides, the special nets which form he *Tonnare* belong to this division. Trawling-nets are much used and of nany varieties. I may mention as more generally in use the following:—*Tartana*, *Tartanone*, *Tratta*, *Sciabica*, *Sciabichella*, *Bragagna*, *Coccia*, *Rezzuola*, *Mazzonara*, *Agugliara*; they principally differ in size and in the manner they re worked. Some are drawn by hand in shore, others by a single boat, others y two boats sailing. To this division may be added the *Bilancia*, *Retequadra*, nd *Giacchio* or throwing net.

Lines and hooks are also much in use, and often very complex concerns, having ifferent names according to the number of hooks, their size, &c.; the best known o by the names of *Palaccioni*, used along the coast, and *Palamiti* or *Palangrese*, sed in deep-sea fisheries.

Traps of different sorts are used for large crustacea, especially lobsters, and go nder the generic term of *Nasse*. Harpoons (*Fiocine*) of different shapes are so in use, especially for capturing the sword-fish, chrysophrys, &c., and in the rious nocturnal *lampadara*-fishery. Special implements are employed for the pture of mollusca and shellfish and for dredging precious coral.

Illegal modes of capturing fish are besides but too often resorted to: thus namite (*torpedini*), cocculus and the mela terragna (*Cyclamen*), are used in the pture of rock-loving fish, with the *Chiusarana* along the Neapolitan coasts.

4. *Marine Animals.*—These will be classed systematically.

*a. Seals and Whales.* These do not afford any special fishery in the Italian as. The Mediterranean seal (*Pelagius monachus*), found also along the S.E. ores of the Adriatic, is by no means common and rarely captured; they are ostly taken alive with nets placed at the entrance of the grottoes they are nown to frequent, and sold to showmen, who exhibit them alive. True whales e of very rare occurrence, only one authentic capture of the all but extinct asque whales (*Balæna biscayensis*) is on record, and took place at Taranto on e 9th of February, 1877; one instance of the capture of *Balænoptera rostrata* is so known, near Villafranca, in February, 1878. Rarely, too, has the fin-backed hale (*B. musculus*) been caught or stranded. Sperm-whales (*Physeter macrophalus*) have occurred now and then in both seas, and occasional specimens of *iphius cavirostris*, *Orca gladiator*, *Pseudorca* (?), *Grampus griseus* and *Globicephalus elas* have been taken. The common cetaceans in the Italian seas are dolphins *Delphinus tursio* and *D. delphis*), who often cause great damage to fishermen by estroying their nets, so much so that those of the Ligurian coast lately petitioned overnment that a prize might be awarded for the capture of dolphins; these e not sought for, although their flesh is eaten along the Adriatic, but near alermo there is an establishment where they are boiled down for oil, together ith the heads of thunnies and other refuse of that fishery.

*b. Turtles.* One species alone may be called common, it is the *Thalassochely ortícata*, sold as coarse food in the markets of Southern Italy; two other species *Thelone viridis* and *Sphargis coriacea* occur, but are extreme rarities.

*c. Fish.* Of the 460 species known to inhabit the Mediterranean and Adriatic Seas, most are sought for by fishermen and used as food; I need only except:

*Centriscus*, *Argyropelecus*, *Coccia*, *Maurolicus*, *Gonostoma*, *Chauliodus*, *Scopelus*, all Lophobranchs, *Orthagoriscus* and *Branchiostoma*, as unfit for human food; the Elasmobranchs are all eaten, even the larger species of sharks which are sent to inland markets, and cut up, sell well. As I before remarked, the Italian seas do not afford many cases of large and important special fisheries, and those few will be quoted further on. I may here add that the most esteemed game-fish, as the Americans style them, are furnished by the following genera: *Labrax*, *Serranus*, *Dentex*, *Mullus*, *Sargus*, *Pagrus*, *Chrysophrys*, *Scorpæna*, *Trigla*, *Sphyræna*, *Ruvettus*, *Trachinus*, *Umbrina*, *Sciæna*, *Lepidopus*, *Scomber*, *Pelamys*, *Orcynus*, *Brama*, *Coryphæna*, *Lichia*, *Seriola*, *Xiphias*, *Merluccius*, *Rhombus*, *Solea*, *Engraulis*, *Clupea*, *Conger*, *Muræna*, *Acanthias*, *Mustelus*, *Raja*. Very abundant, but sold as cheap food for the poorer classes, are species of the following genera: *Mæna*, *Smaris*, *Box*, *Pagellus*, *Trachurus*, *Gobius*, *Lophius*, *Blennius*, *Atherina*, *Mugil*, *Labrus*, *Crenilabrus*, *Pleuronectes*, *Arnoglossus*, *Belone*, *Rhina*, *Torpedo*. In concluding I may remark that there is a notable difference between the fish-fauna of the Mediterranean and that of the Adriatic, the latter has a much more northern character: flatfish abound and attain a greater size, and some genera and species common in that sea, as sturgeon (*Acipenser*), *Gadus euxinus* and *Pleuronectes italicus*, are unknown or very rare in the Mediterranean.

*d. Crustacea.* Most of the numerous species inhabiting our seas are used as food, even the smaller ones; but setting aside the Mediterranean lobster (*Palinurus*), of which I shall speak hereafter, I need only mention those genera which are more often met with in large quantities at our fish-markets, thus: *Maia*, *Cancer*, *Calappa*, *Eriphia*, *Homarus*, *Scyllarus*, *Palæmon*, *Penæus*, *Nika*, *Nephrops* especially in the Adriatic, and *Squilla*.

*e. Mollusca.* Most species of Cephalopods are commonly used as food and sold at the markets along both coasts, but while the tougher species of *Octopus*, *Eledone* and *Sepia* are classed as coarser sorts and sold cheap, the more tender *Sepiola* and *Loligo* fetch higher prices and are much esteemed. A large number of shell-fish are used as food in Italy, and nowhere so well as at Naples, along S. Lucia, may the enquirer satisfy his curiosity on this point; besides the common oyster, of which anon, the tables of the "*Canolicchiaro*" show the following genera, often represented by more than one species: *Solen* (Canolicchi), *Solecurtus* (Lattari), *Donax* (Tonninole), *Venus*, *Cytherea* and *Tapes* (Vongole), *Cardium* (Cocciole), *Pecten* (Canestrelli), *Pinna* (Madrepole); besides *Mactra*, *Mytilus*, *Modiola*, *Arca*, *Spondylus*, *Lithodomus*, and other Lamellibranchs. Univalves are also richly represented by species of the genera: *Patella*, *Haliotis*, *Natica*, *Nassa*, *Murex*, *Tofa*, *Dolium*, &c., &c.

*f. Echinoderms.* This class also furnishes food along the sea-board of Italy, and in the markets near rocky coasts may often be seen baskets of sea-urchins (*Echini*), of which the following species are commonly eaten: *Echinus esculentus*, *E. lividus*, *E. brevispinosus*, and *E. saxatilis*.

*g. Cœlenterata.* Two species of sea-anemone are used as food, and commonly known under the name of "*Ogliole*;" they are *Actinia viridis* and *A. equina*. Other members of this division are the object of special fisheries, but not for the table; they are precious coral and sponges, and will be mentioned by and by.

*B. Special.*

1. *Thunny Fishery.*—This is our most important special sea-fishery, and although the common thunny (*Orcynus thynnus*) is the principal item of this industry, not a few allied species are caught by the same means and treated

a the same manner. I may mention the following: *Orcynus brachypterus*, *O. germo*, *Thynnus thunnina*, and *Auxis Rochei*, all sea fishes, which periodically and successively visit in large numbers different parts of our coasts: thus a precise knowledge of the direction and epoch of such migrations was necessary for establishing the localities and seasons where such fisheries could advantageously be undertaken. The principal thunny-fisheries on the Italian coasts (*Tonnare* and *Tonnarelle*) are: S. Margherita (Liguria), Marciana and Enfola (Elba), Porto S. Stefano (Tuscany), Bivona and Pizzo (Calabria), Portoscuso, Portopaglia, Icola Piana, Calavignara, Flumentorgin, Alghero, Saline, and Trabucato (Sardinia), Olivieri, S. Giorgio, Vaccaro Pepe, Marsamemi, Capo Passaro, Favignana and Formica (Sicily). In the Adriatic thunnies are caught, but we know of no regular *Tonnara* except that of Prelucca near Fiume. The methods used in catching thunnies do not differ much, but the *Tonnare* are of various size and extension; they consist of a series of large chambers closed in by strong netting, the outer one opens widely in the direction from which the migrating fish are to come and so intercepts them, the inner or last chamber is graphically called *camera di morte*—it can be shut off from the rest and drawn up, and here the killing or *mattanza* takes place, a most exciting but not pleasant scene. Curious traditions regulate the doings and the special task of each man employed in the *Tonnare*, and these differ slightly in Sardinia and Sicily; in the *Tonnare* of the former island about 1000 men are employed, in those of the latter about 1400; they give together a yearly product valued some ten years ago at between three and four millions of *lire* (francs); the entire produce of the thunny fishery on the Italian coasts was valued at the same date at about seven millions of francs annually. The incomplete official returns for 1882 give a total of 39 *Tonnare*, not all at work, and the produce of four of these (Pizzo, Bivona, Ischia and S. Margherita) is rated at 271,120 *lire*.

2. *Swordfish Fishery.*—This fish (*Xiphias gladius*) is the object of a very peculiar if not extensive fishery on the Calabrian and Sicilian coasts and in the adjacent Straits of Messina, between the months of April and September. These fish, which have the habit of swimming near the surface, and who also travel in considerable numbers in that season, are sighted by look-outs (*antennieri*), usually seated on the very tall masts of peculiar boats (*feluche*), near these are stationed a number of fast boats (*lontri*) with a shorter mast, on which is perched the *foriere* who follows the direction shouted and pointed to by the *antenniere;* on the prow stands the harpooner (*lanciatore*), and as the boat is swiftly rowed up to the fish, he throws his harpoon (*draffiniera*), the wounded fish is followed up by a second fast boat, the first returning near that which holds the *antenniere*. It is a most exciting scene, witnessed once near Messina. It has been described, nearly in the same words, by Polibius and Spaltanzani and Vetrioli, at an interval of nigh 2000 years.

3. *Anchovy and Sardine Fisheries.*—These two fisheries, which give yearly a very considerable produce, take place usually during the summer months, and the nets called *Manaide* are more frequently used. The anchovy (*Engraulis enchrasicholus*) is caught in greater numbers in the middle and southern parts of the Mediterranean, and especially amongst the Tuscan islands and off the coasts of Sicily; also in the Adriatic, towards the Dalmatian coast. This fishery is practised by fishermen from Chioggia and Ancona. At night fires are lighted to attract the fish, which keep in shoals. The sardine (*Clupea pilchardus*) is caught in much the same manner and during the same season. Both are usually salted, and a preliminary cure is given by the fishermen themselves in their

other species.

5. *Whitebait Fishery.*—This special fishery is only allowed, for par
in a few localities—principally along the Ligurian coast. It is
trawling-nets of a very fine texture, and only from January to Apr
generic name of "whitebait" have been included the "*Rossetti*,
known as *Latrunculus pellucidus* and the "*Bianchetti*," which are
of the anchovy and sardine; the destruction of the latter is certain
to fishery interests, and ought to be stopped or restricted as much

6. *Lobster Fishery.*—In the Italian seas the common lobster of No
(*Homarus marinus*) is rather of rare occurrence, and is re
"*Aligusta*" or "*Aragosta*" (*Palinurus vulgaris*), the object of a
fishery on the rocky parts of our coasts, and more especially amon
islands. Civita Vecchia, Pozzuoli, and Maddalena, in Sardinia, a
principal centres for lobster fishermen; these men seek their fish
considerable distances from their homes, they go in parties in s
sailed boats, secure their prey with peculiar nets or basket-traps (*n*
lobsters imprisoned under water in much larger *nasse*, and
opportunity, embark them alive, carefully wrapped in wet sea-
passing steamer. I once met several of these fishermen on the s
Montecristo, they then had over 2,000 lobsters which they were pre
to Genoa.

7. *Sepia Fishery.*—From very ancient times the capture of the c
fish (*Sepia officinalis*) has been the object of a very peculiar fishery o
Adriatic coasts, from Bari to Manfredonia: small bunches of le
*lentiscus*), called *vorle*, are tied at intervals to a rope and fixed
about 8 or 10 mètres from the shore; the cuttlefish seek their shel
their eggs, and are then easily caught. The present law forbids t
kind of fishing.

8. *Pinna Fishery.*—Near Elba, on the Sardinian coasts, and
S. Antioco, at Taranto, Gallipoli, and along the Sicilian shores, in
shallow water, lives the large and beautiful *Pinna nobilis*, which is

peculiar and of two sorts: the larger from 10 to 14 tons burden, the smaller from 2 to 6; they are decked and have a mast, lateen sail and jib; a peculiar feature is the large wooden windlass amidship, for hauling up the dredge, called *ingegno:* a St. Andrew's cross about 2 mètres in length, weighted with stone or iron, and garnished with about 30 tangles made of rough netting and cordage; other not less primitive implements are used for disentangling the dredge, should the occasion occur. The larger boats are mounted by a master, an assistant, a steersman, and 8 hands; the smaller ones by 5 or 6 men. The coral grows in suitable localities in most parts of the Mediterranean, Ionian Sea, and South Adriatic; it requires a rocky bottom, and affects especially banks covered with madrepora and shells at depths varying from 50 to 200 mètres, rarely more. The coral-patches or banks are mostly as well known to the *corallari* as are the islands which rise above the sea; the best localities are now off the coasts of Sardinia and in the shallow sea between Sicily and Pantellaria, but no doubt undiscovered coral-banks are yet to be found, though probably not many.

During voyages in the Mediterranean *corallini* are often seen at work: in Bonifacio Straits, near Castelsardo, off the W. and E. coasts of Sardinia, but especially between Sciacca and Pantellaria. There, on the extreme edge of the "Adventure Bank," not far from Ferdinandea or Graham's Island, much coral has been got in the last few years, principally off three patches, but mostly dead and blackened, not unlikely killed by the volcanic eruption which caused the above-mentioned island to rise and then disappear in 1831. Many hopes had been raised by the discovery of the Sciacca coral-banks in 1875, 1878 and 1880, and as much coral, though of a very inferior quality, had been got from them, the Government was induced to have them explored. This was partially done at the end of August, 1881, by Professor Ricchiardi. The writer of this was present with him on board the man-of-war steamer *Washington*, and will not easily forget the animated sight of over 300 *corallini* at work, amidst which we steamed on the 30th of August. In 1882 the exploration of those banks was completed, again by the *Washington*, with Professor Canestrini on board; the results were to show that the *dead coral* on those banks has been nearly all fished up. Professor Parona has been recently, by Government order, investigating the conditions of the coral-banks of the Sardinian coasts; his report on the subject is now in the press.

Precious coral was sought for off the coasts of Northern Africa by the Pisans as far back as the tenth century; its discovery off Sardinia dates from the sixteenth century; off Calabria from the seventeenth century. The produce of this fishery appears to be on the decline. In 1871 only 359 *corallini* boats were registered from Italian ports, Torre del Greco alone sending 307. The men engaged in this fishery numbered 3623, and the mean annual produce was calculated at about 60,000 kilogrammes of good *living* coral, of the approximative value of five millions of *lire* (francs). The produce of the coral fishery on the Sciacca banks from March to October, 1882, as given by official returns, was 19,120 *quintali*, valued at 4,493,200 *lire*; 582 boats and 5766 men were employed. The banks discovered in 1875 and 1878 are quite exhausted; that found in 1880 is expected to yield from 20 to 25 *quintali* per boat during the present season, 1883. It must be remembered, however, that this is all or nearly all *dead* coral of low price.

The coral-fishery is usually undertaken from March to October, but in some parts, weather permitting, it takes place at all seasons.

10. *Sponge Fishery.*—This industry is principally in the hands of Adriatic

fishermen, and undertaken amongst the rocky islands off Istria and the Dalmatian coasts; a certain number of Sicilian fishermen are, however, employed in this fishery off the Tunisian coast near Sfax. The species sought are: *Spongia mollissima*, the most valuable, *S. adriatica* (?), *S. zimoca*, *S. equina*; the methods employed are two—diving and trawling.

## IV. Lagoon and Estuary Fisheries.

These fisheries, which in all respects form a connecting link and occupy an intermediate position between saltwater and freshwater fisheries, have a special importance in Italy on account of the number and extension of salt and brackish-water lagoons near the mouths of rivers or elsewhere; such are the extensive *valli* of Comacchio, Codigoro, and those further north joining on to the Venetian lagoons; the large Sardinian *stagni*, as those of Cabras (Oristano) and Cagliari; the *stagni* of Orbetello and Burano in Tuscany, that of Lesina in Puglia, and others; and in a way the *Mare piccolo* of Taranto. Fish, crustacea, and mollusks are the product of these fisheries, which also give occasion to a special kind of pisciculture, of which anon; I need here only dwell especially on some of the former as yielding the more valuable produce. Many species of crustacea are taken, and I may mention *Carcinus mænas*, one of the more abundant, used however chiefly as bait; while *Eriphia spinifrons*, *Crangon vulgaris*, and *Squilla mantis*, are esteemed as food. The more remarkable mollusks belong to the genera, *Sepiola*, *Sepia*, *Cerithium*, *Gibbula*, *Solen*, *Tapes*, *Cardium*, *Mytilus*, and *Pecten*.

Not a few fishes generally considered marine enter the brackish water lagoons and live and thrive there in company with other species usually classed amongst freshwater creatures. I may mention the genera, *Labrax*, *Mugil*, *Atherina*, *Solea*, *Pleuronectes*, *Esox*, *Lenciscus*, *Anguilla*. In purely saltwater lagoons some of the finer sorts of game sea-fish abundantly resort, as *Mullus*, *Chrysophrys Umbrina*, *Corvina*, *Rhombus*, and several species of *Gobius*, especially *G. paganellus* and *G. ophiocephalus*. The special fisheries of greatest economic value undertaken in Italian lagoons and estuaries are the following.

1. *Grey Mullet Fishery.*—The genus *Mugil* is richly represented in our Ichthyofauna; the six species, *M. cephalus*, *M. capito*, *M. auratus*, *M. saliens*, *M. labeo*, and *M. chelo*, are common, the first four abundant, and live not only in the sea but frequent brackish waters and enter rivers. In some of the *valli*, lagoons and *stagni*, their capture is on a very large scale, and gives a notable produce; a peculiar net, the *mugginara*, is usually employed. Prof. Targioni Tozzetti graphically describes one of these fisheries, which he witnessed at Cabras in Sardinia: the proceedings resembled on a smaller scale those at a *Tonnara*, but the men dived and seized under water the mullets imprisoned in the *mugginara*, the scene being a most curious and exciting one; on that occasion 1200 kilogrammes of fish were secured and considered a poor result.

2. *Eel Fisheries.*—The common *eel* (*Anguilla vulgaris*), with its many varieties and sub-species, is one of the most common fishes in Italy; it is caught in the sea, in brackish waters, and in fresh water, but more especially in lagoons and estuaries, and affords one of the more important items of our fisheries. It is now well known that the eel reproduces itself at sea, the young fry entering rivers and lagoons in myriads, and along the coast between Leghorn and Viareggio, in canals leading from the sea into the Arno and adjacent lagoons. This gives occasion to a most peculiar fishery, that of the *Ceche*, such being the name given

these young vermiform and semi-transparent eels. During the months of ecember, January, and February, they swarm in countless numbers in such calities, where, for special local reasons, their capture is allowed during the riod designated.

In the so-called *lagune, campi* or *valli* of Comacchio, extensive salt and ackish water lagoons at the delta of the Po, between the branches called *Po di olano* and *Po di Primaro*, eel fishery is an ancient and important industry. nly the adults are caught, and principally at two periods, autumn and Lent. o give an idea of the produce, I may state that the *valli* belonging to omacchio alone give a mean annual produce of 825,000 kilogrammes of *reserved* eels, valued at 735,000 *lire*. In 1871, 1,307,558 kilogrammes of eels ere got.

## V. Freshwater Fisheries.

I have already stated the reasons why these are not of great importance in Italy; except in the northern portion of our country, the rivers are insignificant and the lakes of small extent; the freshwater fish fauna is besides not rich in species of economic value, such as elsewhere in Europe form the object of an important piscatorial industry, as salmon and sturgeon are entirely wanting or not abundant. As I have before mentioned, for obvious reasons, special regulations, distinct from those relating to sea fisheries, regulate those in rivers and lakes. The fishermen on fresh waters are far less distinct as a class than those who seek their living on the sea, yet in some localities they also form a distinct part of the community. The boats they employ, with their flat bottoms and inelegant shapes, rarely rowed, and more often poled, are very different from the sea-going ones. Again, the nets they use are often different and always of smaller size. In fresh waters it is easier to employ illegal methods for capturing fish; and various poisonous substances, such as cocculus, euphorbia, lime, &c., besides dynamite, have but too often decimated the finny inhabitants of many a streamlet or pond.

*a. Amphibia.* The frog (*Rana esculenta*) forms in Northern and Central Italy a not unimportant item of the small gains of the freshwater fisherman; especially in spring and autumn they are brought alive in thousands to the market. They are classed with the finer sorts of freshwater fish, the fleshier parts of the hind legs being considered a delicacy by many.

*b. Fish.*—A most marked contrast exists between the freshwater fish fauna of Northern and Peninsular Italy. South of the Appennines the species are few and of slight importance—small trout in the mountain streams, carp, tench, barbel, rudd, and a few other *Lencisci*, with the ubiquitous eel, nearly complete the list, and barely afford a precarious living to their captors. The more important rivers and larger lakes of Northern Italy are better stocked and give opportunities for a larger piscatorial industry. The most esteemed species are: perch, *Coltus gobio*, *Lota vulgaris*, trout, grayling, pike, shad, and sturgeon. In the larger lakes of Lombardy, and more especially in Lago Maggiore and that of Garda, lake-trout of large size (*Salmo lemanus* and *S. carpio*) are caught in considerable numbers; and again the shad (*Clupea alosa*) of two varieties: one resident known as "*Agone*," the other migratory entering rivers from the sea in spring, called "*Cheppia*." The Po and Adige are besides periodically visited by numerous sturgeons (*Acipenser sturio*, *A. huso*, *A. Naccarii*, and *A. Nardoi*), some of which attain a very large size.

*c. Crustacea.* The common crayfish (*Astacus fluviatalis*) is pretty common all

over Northern and Central Italy, but of late years it has been nearly exterminated by a curious epidemic, manifest in an infusorian which fixed itself in countless numbers over the branchiæ, finally preventing respiration. Crayfish-culture has not, it is believed, yet been attempted in Italy, where it might easily succeed.

In Central and Southern Italy a fresh-water crab (*Telphusa fluviatilis*) is pretty common and sought for; near Florence they are kept for some time in the dark, isolated in earthen jars, so that they shed their carapace, and becoming soft are more easily eaten.

*d. Vermes.* The common leech (*Hirudo medicinalis*), found in most parts of Italy, was in past years, when more extensively used for medicinal purposes, eagerly sought for; between 1828 and 1851, the authorities of Sardinia, Rome, and Parma, issued special edicts for its protection. No later documents with that object have been noted, but in the neighbourhood of Turin leeches are specially reared for medicinal use.

## VI. Pisciculture.

This important branch of industry is as yet in an incipient condition in Italy whereas it has of late years made such rapid strides in other countries; and yet in this, as in many other things, we may and can look further back than most nations, and recall the time when our forefathers, the Romans, had such tender cares for their *piscinæ*, *vivaria murænorum*, and *cetaria*, and reared oysters in Lake Lucrinum,* carrying them thither from the far shores of Brundusium and Tarentum.† Of late, however, some progress has been made, and the future promises well.

1. *Fish-culture in Lagoons.*—This is a very peculiar kind of industry, the first step towards true artificial fish-culture; it is most extensively practised in the salt and brackish-water lagoons which occupy so large a surface between the mouths of the rivers Reno and Isonzo, on the Adriatic coasts, and goes by the generic term of *vallicoltura*. It originated in the peculiar nature of that extensive region, and dates back far into the earlier part of the mediæval times, for in the archives of Venice documents exist relating to lagoon-fishery of Chioggia dated 888. In the years 1118 and 1181 *piscariæ aquæ* are mentioned, and in 1425 documents relating to *clausura vallorum* appear. Up to the present time much has been written on *Vallicoltura* in the Venetian provinces, but especially the recent concise publications on the subject by Dr. Renier and of Count Nani. The latter, who knows more about the matter than most men, exhibited a most complete and interesting collection of models of boats, nets, implements, &c., used in the Venetian lagoon-fisheries, at the Milan Exhibition of 1881.

*Vallicoltura* is practised in much the same manner in the *valli* of Comacchio, Codigoro, Chioggia, Venice and Caorle. It consists in dividing and partitioning the outer and inner lagoons, using natural formations and artificial structures, such as embankments, palisades, &c.; the adult fish who resort to lagoons for spawning purposes, and more especially the young fry who enter from the sea in search of food, are thus protected, divided, and at the right time captured. The system of division and subdivision in the *valli*, especially in the inland ones, is very complicated, and as this industry is most important and of quite a

* Murlae Balaro mellor Lucrina peloris.—(Horace, *Sat.* 2, iv.)

and

† Pectinibus patulis jactat se molle Tarentum.—(Ibid.)

will at once occur to our schoolboys.—[Ed.]

liar nature, I am sorry for want of space to be prevented from giving further ls. The *valli* are classed into—*valli arginate, valli arginate in parte*, viz., ially closed by reed-palisades (*grisiole*), and *valli chiuse*, or completely closed *risiole;* locks or *chiaviche* regulate the communications and the water ly. The natural entry of fish-fry from the sea into the lagoons goes by the e of *montata*, and the more important *montate* take place from February to (*Mugil capito, M. auratus, M. chelo, Labrax lupus, Chrysophrys aurata* and *uilla vulgaris*), and in August and September (*Mugil cephalus, M. saliens, lus.*)

peculiar feature in this industry is the so-called "*Semina del pesce novello,*" rally "sowing of young fish." It consists in capturing in fine nets along the st or in the external lagoons the young fry of the species above mentioned, in carrying it to the inner waters or closed *valli*, that it may grow and be ed at the proper time. The utility and expediency of such proceedings has n for the last two centuries an object of discussion amongst the *Vallicultori*, e of whom up to the present day opine that the natural *montata* and its litation is the true system of *valli*-culture. To give an idea of the value of present lagoon-fishery and pisciculture, we may add the statement of Count ini, who in 1881 writes that in the northern lagoons alone (between Porto sone, Adige, and the mouth of the Isonzo) 600 boats and 25,000 fishermen employed in this industry; and he adds that these data are rather below the e number for both. Quite a series of boats, nets and implements of various ds are used in *Vallicoltura*, and the men therein employed have each their cial task.

. *Fish-culture in Fresh-waters.*—I include under this term the artificial pro- ation and introduction of important food-fishes; in this line little indeed has ret been done in Italy. The first attempts were made in 1859, in the small es of Trana and Avigliana in Piedmont, by Professor F. de Filippi and Sir nes Hudson, then British ambassador at Turin: eggs of lake-trout, Salvelin, Salmon from Hüningen were introduced, and the following year to these e added those of *Coregonus* from Lakes Bourget and of Geneva; unfortunately, account of the absence of Prof. de Filippi, first in Persia, and then in a ago round the world, during which he died, the work was discontinued ore any results could be obtained. In 1861, de Filippi went to Lake Con- ce, on purpose to fecundate eggs of *Coregonus lavaretus;* 600,000 of these e thrown into Lake Como at Colico, and about a million in Lake Maggiore, e being incubated at Avigliana, others at Baveno, with Coste's system. ain, in 1862, Government acquired 70,000 fecundated eggs of the Salvelin n Kuffer (Saltzburg); 25,000 were kept at Avigliana, 40,000 deposited at eno to be placed in Lake Mergozzo, and 5000 destined for Lake Montorfano mo). As I said above, these operations so well begun were unfortunately continued. However in April, 1881, a *Coregonus* of large size was caught Lake Maggiore, evidently one of those introduced from Lake Constance. 1861, at Venaria Reale, H.M. King Victor Emanuel, initiated a small i-cultural establishment, now obsolete. In 1864–65, Dr. P. Carganico de a similar attempt for trout at Como. In 1871 Dr. Revelli founded a icultural establishment for trout and salmon at Savigliano; this succeeded part, but eventually failed simply for want of pecuniary support, in 1879. attempt of a similar nature, on a larger scale, was made at Isola della ola near Naples, by a Signor De Negri; this also failed through want of ney. In 1878 Messrs. Turri and French commenced the artificial propaga-

tion of trout in one of the mountain streams near S. Marcello (Pistoia), and although entirely dependent on their own private means, have been thus far successful. Again the Agrarian Committee of Bardolino (Verona) have decided to found a piscicultural establishment on Lake Garda; on this project the Fisheries Committee reported favourably. Finally, Government has begun the formation of a small piscicultural establishment for trout in the Royal Forestal School at Vallombrosa, in order to impart practical instruction in the matter to those students. Before concluding, it should be mentioned that a successful piscicultural establishment has been working, since 1879, at Torbole near Riva (Tyrol).

3. *Oyster- and Mussel-culture.*—The inner sea of Taranto (*Mare piccolo*) and Lake Fusaro, near Naples, which had lost its ancient renown but appears now in a fair way of regaining it, are the principal centres of oyster-culture in Italy; the species reproduced is *Ostrea edulis*, several varieties of which are known. Prof. Targioni Tozzetti calls the Taranto oyster *O. lamellosa*. The young oysters are collected in the autumn on bundles of branches which had been purposely immersed during the preceding spring in suitable localities in the *Mar Grande* at Taranto, weighed down with stones; these young, called *cria*, are inserted into loosely twisted ropes (*pergolari*) made of *Spartium*, which hang from the larger ropes supported on piles which form the *sciaja*, such being the name of the quadrangular spaces in the *Mare piccolo* specially allotted for this oyster culture. The oysters thus transplanted are fit for eating after eighteen months or two years, during which the *sciaje* are carefully kept clean. These oysters becoming adult spawn, but the young larvæ thus produced do not thrive, and the *sciaje* must be kept up by new *cria*, procured, as I have described, in the *Mar Grande*. The mean yearly produce of the *sciaje* of Taranto is valued at six millions of oysters, priced from five to six francs the hundred. The Taranto oysters are beyond doubt amongst the finest I have seen and tasted anywhere. A small oyster culture exists also in the Faro Lagoon, near Messina.

At Taranto again, and also in some of the Venetian *valli*, the edible mussel (*Mytilus edulis*) and, especially at Taranto, the more esteemed *Modiola barbata*, are largely cultivated. In the *Mare piccolo* of Taranto the same system is used as that practised for oysters. The reserved spaces are, however, called *quadri*, enclosed as the *sciaje* by piles driven vertically down; the bigger ropes are called *libani*, and the dependent smaller ones with free extremities again *pergolari*; the latter usually number nearly 6000 in each *quadro*. The young mussels, also called *cria*, are carefully collected and inserted into the purposely uncoiled *pergolari*, where they fix themselves with their byssus. In about eighteen months, during which they are carefully kept clean, the *pergolari* being regularly aired to kill parasites, they attain maturity. An average *quadro* may thus produce about 150,000 kilogrammes of mussels of the approximate value of 17,000 lire (francs), including expenses. The entire produce at Taranto has been calculated at 16,000 *quintali* per annum.

In November, 1881, Dr. Giglioli was at Taranto, and visited the oyster and mussel culture establishments on the *Mare piccolo*, but found their owners in great distress; unusually violent storms a few days before had committed great havoc amongst the *sciaje* and *quadri*, which those poor people were busy cleansing and repairing. Quite recently my friend Professor H. Issel, of Genoa, has published by Government order a valuable treatise on oyster and mussel culture (*Istruzioni per l'Ostricoltura e la Mitilicoltura*, GENOVA, 1882).

## VII. Conclusions.

The rapid and synthetical account now concluded has, we trust, succeeded in giving a fair though very general idea of Italian fisheries. Here and there are given a few statistical data, but it must be borne in mind that such data can only be approximative. I should have wished before concluding my task to have given more statistical data, such being considered now-a-days the best manner of expressing the conditions of industrial undertakings and many other matters, but few will contradict the assertion that of all sources of produce, fisheries are beyond doubt those to which it is most difficult to apply that test, for obvious reasons. During the first session of the Fisheries Committee, Dr. Giglioli to report on this very subject, viz., "*How to obtain annual statistics of the produce of Fisheries;*" then, as now, his conclusions were that the problem is a most difficult one, and can never be thoroughly solved. He, however, adds some general returns, the result of the inquiry for collecting materials for the law on fishery between 1869 and 1871, giving them for what they are worth. From the report on fisheries then presented to Parliament he quotes the following data: The number of men engaged in sea-fisheries on December 31st, 1869, with the exclusion of the then Papal States, was 60,000, employing 18,000 boats and giving a mean annual produce valued at 40 millions *lire*. It does not appear that any statistics were then collected for the important lagoon and estuary fisheries, and the results relating to freshwater fisheries are far from complete; they gave the numbers of fishermen at 3000, and the value of produce at between 3 and 4 millions of *lire*. For the sea-fisheries the best source of information were the maritime inscriptions, and they may easily give erroneous results for the special object in view. In 1878 the official returns give the following data: Fishery products *exported*, 39,887 kilogrammes, value 2,259,670 *lire;* fishery products *imported*, 44,060,300 kilogrammes, value 21,479,740 *lire*. These data cannot be much altered now, and show an immense difference in favour of imports, a proof that our consumption is not balanced by our produce. At present our fisheries, as an industry, considered *en masse*, cannot be said to prosper, but no doubt better days are in store, and will come for this as for other Italian interests; the actuation of the new law on fishery, and the untiring exertions of Government to aid and protect individual enterprise, cannot but lead to good results.

The *bibliography* relating to Italian fish and fisheries is rich and extensive; a valuable contribution on that subject, was collected by Dr. Cavanna for the Berlin International Fisheries Exhibition in 1880, and published at Government expense.

Royal Zoological Museum, Florence,
*April* 12, 1883.

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[*Up to the time of going to press with the First Edition, the List of Exhibits for Italy had not been received.*]

# JAPAN.

[*Up to the time of going to Press with the First Edition the Official Introduction to the Exhibits from Japan had not been received.*]

## LIST OF EXHIBITS.

### CLASS I.—SECTION I.

### FISHING.

[SEA FISHING.]

DIVISION I.

**Gear of every description and of all nations used in trawl, herring, long line, hand line, and every other mode or system of fishing, including all nets, lines, hooks, harpoons, tackle, &c., employed in the same.**

Lines for Fishing "Tai" (Chrysophyrys major).
Lines for Fishing "Karei" (Plalessa flesus).
Lines for Fishing Codfish.
Implements for Fishing Mackerel.
"Tamo," Small Bag Net with Handle and "Uchikaki," a kind of fish-hook.
Various kinds of Fish-hooks, Fishing Lines, and Floats.
Accessories to the Lines for Fishing Codfish.
Fishing Rods.

### CLASS III.

### COMMERCIAL AND ECONOMIC.

**Preparation, preservation, and utilisation of fish, and all forms of life included in Class V.**

DIVISION XXVI.

(*a*) For edible purposes—

ii. Fish dried, smoked, cured, salted, tinned, or otherwise prepared for food.

Mackerel, dried.
"Hamachi," a kind of fish, dried.
"Tai" (Chrysophyrys major), dried.
Salmon, smoked.

Codfish, dried.
Sardines, preserved in Oil.
Tunny, ditto.
Salmon, tinned.
"Masu" (Salmon sp.), tinned.
Salmon, preserved in Vinegar.

### Division XXVII.

iii. All products prepared from fish, such as oils, roes, isinglass, &c.

Cod Liver and other Fish Oils.
Fish Wax.

### Division XXIX.

(*b*) For other than edible purposes—

i. Oils, manures, and other products prepared from fish.

Isinglass, Glue, and Dried Sardine for Manure.

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## Class V.

## NATURAL HISTORY.

[AQUARIA.]

**Specimens living (marine and fresh water), fresh, iffed or preserved, casts, drawings, and representa-ons of—**

### Division XLIV.

(*c*) Corals in their natural state, polyps, jelly-fish, &c.

Coral.

### Division XLVI.

(*e*) Mollusca of all kinds and shells not included in Class III.

Shell of Sea-ear.
"Hotsu-sugai," a kind of shell-fish.
Oyster, tinned.

### Division L.

(*i*) Crustacea of all kinds.

Crab, stuffed.

### Division LIV.

(*s*) Aquatic and amphibious mammalia (otters, seals, whales, &c.) and others trimental to fish.

Fibre of Whale-bone.

# MOROCCO.

[*Up to the time of going to press with the First Edition, the Official I*
*to the Exhibits from Morocco had not been received.*]

DIVISION I.

**Gear of every description and of all nations**
**trawl, herring, long line, hand line, and every oth**
**or system of fishing, including all nets, lines, hoo**
**poons, tackle, &c., employed in the same.**

Moorish Fishing Tackle, Rods, Fitted Lines, Gaffs, L
Baskets, various.
Sole and Turbot Spears.
Sundries.
Baits, artificial.
Baits, natural, in spirits. These include mussels, b
octopus, rockworms, prawns, "red-bait," small fish.
Dams, &c. (Models).

DIVISION IV.

[redacted]

## Division XXVI.

**Preparation, preservation, and utilisation of fish, and all forms of life included in Class V.**

(a) For edible purposes—

ii. Fish, dried, smoked, cured, salted, tinned, or otherwise prepared for food.

Shebbel and other fish, dried and salted for trade.

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## Division XLVI.

**Specimens living (marine and fresh water), fresh, stuffed or preserved, casts, drawings, and representations of—**

(e) Mollusca of all kinds, and shells not included in Class III.

Collection of Marine Shells.
Collection of Freshwater and Land Shells.

## Division LI.

(k) Fish of all kinds.

Specimens of Fish (of commerce and curious).
Fish of prey.

## Division LII.

Reptiles, such as tortoises, turtles, terrapins, lizards, serpents, frogs, newts, &c.

Freshwater and land tortoises (alive).
Reptiles, in spirits.

## Division LIII.

Aquatic and other birds hostile to fish or fishing.

Birds of Prey, stuffed.

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# Class VI.

## Division LX.

**Reports, statistics and literature of fish, fishing, and fisheries.**

Pamphlet on Moorish Fisheries.
Photographs of Fishing Scenes and Places, &c.

# NETHERLANDS.

## Herring Fishery.

The principal branch of this great fishery of the Netherlands is carrie the North Sea annually from the month of June to the beginning of No its special localities being in the vicinity of the coasts of Scotla England; also, in the latter portion of the season, in a more southerly d near the Dutch coasts. In this calling there are occupied a great nu smacks, luggers and cutters, nearly all issuing from the ports of South H besides the so-called "bomschuiten" vessels, which, owing to the neces their being dragged along the shore, are furnished with a flat bottom ins a keel. The fleet after a long period of decline has improved since 185 Holland abolished the system of premiums, and put an end to all kinds tection for the fisheries and left them unrestricted. The number of l luggers and cutters was 89 in 1867, and in 1881 had increased to 1 number of "bomschuiten" likewise increased from 189 in the former t the latter year. Besides this the tonnage of the different vessels g became larger, so that they now take out to sea more nets than was form case. The tonnage of the luggers gradually increased from 147 to 2 metres, and that of the boats from 90 or 100 to 140 or 150 cubic metres.

The luggers and cutters are manned by fourteen or fifteen hands; t by ten or eleven. The whole fleet consisted in 1881 of 408 vessels, m 19,800 tons (each of 2·83 cubic metres), and were manned by 4840 sail

The captured herrings are for the most part cured almost immediat they are taken and on board ship, while another portion are first salted being smoked and sold as red herrings to the trade. The productio late years remained prosperous, consisting in 1880 of about 227 mill in 1881 of about 197½ million of fish, representing a market value of 3 and 4 million guilders. The principal destination of the salted he Germany, the smoked ones being sent to Belgium. Similarly with the tion, the export has also remained steady. The export of cured increased from 80,000 barrels in 1872 to 134,600 barrels in 1881 and barrels in 1882. The abolition of the official brand to which Holland 1878, far from hampering the home trade, has given it a remarkable impe that period. On the other hand the export of smoked herrings has d from about 68 million head in 1872 to 41½ million in 1881. This dimi however solely due to the circumstance that so high a price is now obt the cured herring that a smaller part of the whole capture is now con the smoking room than was formerly the case.

Besides those caught in the North Sea, Holland obtains considerable ties of herrings from the Zuider Zee. This fishery, which begins in th of October, continues to March or April, but is often delayed for months keeps perhaps a thousand small vessels in employment, each of which is by two or three men, who bring their take daily to the shore. The pr

very irregular, but may be set down at from 40 to 50 million fish. These herrings are of much inferior quality to the herrings from the North Sea. They are either smoked singly, ugh last year high prices were obtained from them fresh, in which state they are largely used by the poorer classes. If the capture is a very large one, large quantities of them are often used for manure.

### Salt Cod.

The smacks and cutters which in the summer carry on the herring fishery are occupied during the winter in the capture of codfish with hooks and lines in the vicinity of the Dogger Bank, the cod being principally prepared as salt fish. The not very profitable results obtained from this fishery—a consequence probably of the high price of the bait—is no doubt the cause why many of the ships during winter either lie still or engage in the capture of *fresh* fish. On the contrary there are in Holland about fifty other vessels, each with a crew of thirteen men, which carry on exclusively the capture of cod and shell-fish, and during a part of the winter, join the fleet which fishes on the Dogger Bank and bring away the salted produce. The returns of this fishing has of late years varied between 20,000 and 25,000 barrels, while the export of salted cod amounted in 1881 to 575,000, and in 1882 to nearly 894,000, kilogrammes, Belgium and Germany are almost exclusively the consumers of this article.

### Fresh Fish.

Next to the herring fishery the capture of fresh fish is the principal one in Holland. The fish are sometimes caught with hooks, but more frequently with trawls and other drag nets. In this fishery all the "bomschuiten" of the coast take part during the winter, and some of the luggers which carry on the herring fishery in summer; also the fifty large vessels referred to above, and all sorts of other vessels great and small hailing from the small towns along the coast.

The complaint of scarcity, especially in regard to flat fish, becomes gradually more general, but it should be noted on the other hand that extravagantly high prices are obtained for fresh fish, so that the prosperity of fishermen is now on the whole greater than was formerly the case. A great part of the fish is exported, more particularly for Belgium. In the last three years the following quantities were exported :—

| | |
|---|---|
| 1880 | 6,959,000 kilogrammes |
| 1881 | 4,800,000 ,, |
| 1882 | 4,311,000 ,, |

These figures however do not include the export of shrimps, which in 1882. amounted to 1,178,000 kilogrammes, nearly all of which quantity was sent to England.

In the Zuider Zee are caught, in addition to herrings as above stated, anchovies, plaice, congers, and shrimps. The anchovy fishery, which, from May to July, employs some 1200 boats, is in fortunate years the richest product of the Zuider Zee. The harvest is however extremely uncertain, for while in abundant years it sometimes amounts to over 70,000 baskets each of about 3,500 fish, in poor years the whole may be put down at 1000 baskets. During the last six years the catch has been extremely small.

### Culture of Shell-fish.

Oyster breeding in the province of Zeeland, until lately unimportant, has during the last fifteen years increased considerably, thanks to the particular care bestowed on the enrichment of the beds and the high price obtained for the produce—of late years from 60 to 65 guilders per 1000. In 1881 21,800,000 oysters were brought to market, half of which quantity was sent to England while the other half was either retained for home consumption or sent to the Belgian and German dealers.

Next to that of oysters, the production of mussels is very important, both in Zeeland and in the Zuider Zee. From the last-named sea there were sent, in 1881, to England, *viâ* Harlingen, 11½ million kilogrammes of this shell-fish.

### Salmon Fishery.

The fishery of salmon in the Dutch rivers is now in a very satisfactory condition, not only on account of the rich catches, but also in consequence of the very high prices obtained for the supplies. At Kralingen, a village in the neighbourhood of Rotterdam, which is the centre of this trade, there were sold in 1882 55,079 head. The prices fetched varied from about f. 7 to f. 1 per kilogramme. The greatest harvest in the last decade was in 1874 (77,070 head), the lowest in 1879 (38,914 head).

### Funds for Fishermen.

At the principal fishing ports there exist funds called "rents" for the maintenance and education of the widows and orphans of fishermen who are drowned. These funds are partly kept up by voluntary contributions, and partly by contributions by masters of vessels and by fishermen.

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## LIST OF EXHIBITORS.

## FISHING.

[SEA FISHING.]

### Division I.

**Gear of every description and of all nations used in trawl, herring, long line, hand line, and every other mode or system of fishing, including all nets, lines, hooks harpoons, tackle, &c., employed in the same.**

**COMPANY FOR SEA FISHERIES,** Maassluis: Manager, Ch. Maas.

A rigged Trawl Net, with pit-rope.
A ditto.
A Loose Pit.

**OMPANY FOR SEA FISHERIES**—*continued.*

A Ground Line, with wide rigged hooks.
A ditto, with close rigged hooks.
A Basket, with baited fishing lines.
A Buoy and Grapnel Line, for groundline fisheries.
A Buoy, for groundline fisheries.
A Grapnel.
A Gaff.
Model of a Lamprey Tub at a quarter of the real size.
A ditto.
A Deep Sea Hand Line, with lead, hooks, and basket.
A Rest for same.
A Herring Net, for bait fishing.
A Cork-rope of Manilla Hemp.
A ditto (Cotton).
A Bowl.
A Head Bowl.
A used Herring Net, mounted and rigged ready for fishing.
A used Herring Net, unrigged.

**MIRREN, J. VAN,** Vollenhoven.

A Pit Net.
A Flounder Drag Net.
A Herring ditto.
A Silk Flounder Net.
A Silk Smelt Net, for fishing under the ice.
Two Herring Bow Nets, with three side nets.
A Silk Perch Net.

**WUYSTER, M.,** Maassluis.

A Herring Net, mounted and rigged in 1876, and since used every year.
A Herring Net used since 1877.
A ditto, used since 1878.
A ditto, used since 1879.
A ditto, used since 1880.
A ditto, used since 1882.
A part of a Back Rope, sufficient for six herring nets, fixed to the warp.
An ordinary and a painted Head Bowl.
Six Ground Lines, with hooks and bait basket for cod fisheries.

**ANDERSON, ABBOTT, EN ANDERSON,**
**37, Queen Victoria Street, Londen, Engeland.**
De Grootste Fabrikanten der Wereld van de
**BESTE GEWAST TAFFEN KLEEDINGSTUKKEN.**
**Prijsmedailles van alle Internationale Tentoonstellingen.**

**WUYSTER,** .—*continued.*

(Herring Casks.)

A Set of Casks as used for salting and packing the Dutch herrings as: $\frac{1}{1}$, $\frac{1}{2}$, $\frac{1}{4}$, $\frac{1}{8}$, $\frac{1}{16}$, $\frac{1}{32}$, $\frac{1}{64}$, and a small one for 6 herrings.

Two Casks (Scotch model), all made by the Exhibitor, and exclusively for his own use.

**HOFLAND EN ZOON, J.,** Brielle.

A Trawl Line.
A Bridle for Luggers.
A Heavy Warp.
A Light ditto.
A Trawl Rope.
A Hawser.
Two Bridles for Bomboats.
Two parts of a bridle for Bomboats.
A Seam for Herring Nets.
Three parts of a Back Rope—one unprepared, one tanned, one tarred.
A Piece of Seizing (light).
A Piece of Seizing (stronger).
Two Manilla Ropes, for raising and lowering the mast.
A Buoy Line.
A Stay for Bomboats.
A Set of Shrouds.
A Bowl Rope, Manilla hemp.
Three Splice Pins.
Two Tanned Ground Lines for Cod Fishery.
Two Tanned ditto, Italian hemp.
Two Tanned ditto, Dutch hemp.
Two Hanks of Dutch Hemp.

**GROEN, W.,** Blacksmith, Scheveningen.

A Complete Trawl Net for Sole Fishery, with beamheads of the Exhibitor's invention. The size and form of the net are in all parts according to the backnet used by the bomboats of Scheveningen.
A Hand-net used in herring fishing.
A Double Grapnel.
An Anchor with Four Flukes.
A Common Anchor.

**ANDERSON, ABBOTT, EN ANDERSON,**

**37, Queen Victoria Street, Londen, Engeland,**

Uitsluitende Fabrikanten, en Leveranciers aan de Londensche Politie, van den GEBREVETEERDEN WEL AFGEWERKTEN WATERPROEF SCHOUDERMANTEL ten dienste der Politie, zooals deze wordt gedragen door de voornaamste Engelsche, Iersche en Schotsche Politie-corpsen.

**GROEN, W.**—*continued.*

Two Blocks of Galvanized Iron, for lowering and hauling the bomboats.

An Iron Hauling-hoop with Peg and Iron Pin.

**MAAS, A. E.**, Scheveningen.

(Nets in different stages of preparation.)

Four Nets, 15–29, 720, unprepared.
Two ditto, once tanned with cachou.
Ditto, twice tanned with cachou.
Ditto, three times tanned with cachou.
Ditto, four times tanned with cachou.
Ditto, five times tanned with cachou.
Ditto, five times tanned with cachou, and once in linseed oil.

**GROENEMEGEN, A.**, Maassluis.

A Herring-net used for several years.

**GALEN, B. van**, Yarn and Twine Manufacturer, Gouda.

60 Turns 4 Twists Trawl Yarn.
80 ditto.
100 ditto.
120 ditto.
130 ditto.
160 ditto.
100 Turns 3 Twists Drag Yarn.
120 ditto.
150 ditto.
180 ditto.
200 ditto.
250 ditto.
300 ditto.
350 ditto.
375 ditto.
400 ditto.
450 ditto.
300 Turns 2 Twists Weel Yarn.
350 ditto.
400 ditto.
450 ditto.
500 ditto.
550 ditto.
600 ditto.

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GETUIGSCHRIFT, door ANDERSON, ABBOTT en ANDERSON ontvangen, aangaande de Waterproef Schoudermantels ten dienste der Politie alsmede van Waterproef Beenbekleedsels, door dezen geleverd.

Bureau van den Ontvanger der Londensche Politie,
4 Whitehall Place, S.W., den 21 Julij 1869.

NIEUW FORMAAT SCHOUDERMANTELS.

Kort Extract van het Rapport door de Superintendanten ingeleverd, aangaande de Model-Schoudermantels in Januarij 1868 aan de Divisien A, B, C, K, N, en E uitgedeeld.

De Superintendanten verklaren, dat deze Schoudermantels, veel beter dan de vroeger gebruikten, weinig slijten, uitmuntend waterdicht zijn, niet barsten en er nog goed uitzien; in de Divisie B hebben de manschappen de overtuiging, dat zij de beste Schoudermantels zijn, die ooit aan de Politie zijn verstrekt; de Divisie B is van oordeel, dat Model No. 2 een weinig beter dan No. 1 is.

(*Was getekend*) THOS. KITTLE, *Superintendent.*

**GALEN, B. van**—*continued.*

200 Turns 3 Twists Seam Yarn.
250 ditto.
300 ditto.
400 ditto.
500 ditto.
600 ditto.
700 ditto.
800 ditto.
1000 Turns 2 Twists Yarn for Pike Nets.
1000 Turns 3 Twists Yarn for Pike Nets.
Sail Twine, No. 1.
Ditto, No. 2.
Ditto, No. 3.
Fishery Hook Lines.
Ground Lines.
Mackerel Hook Lines.

(Hatcheled elements.)

Dutch Hemp.
Hemp from the Baltic Sea.
Italian Hemp.
Dutch Flax, blue.
Ditto white.

**BOUWMAND, D.**, Cord and Twine maker, Moordrecht.

A Bunch, 80 turns, Trawl Twine, 42 strings, Dutch hemp.
Ditto, 60 ditto.
Ditto, 160 ditto, Drag Twine, ditto.
5000 Cord-Nosings, Manilla hemp.
5000 Single, ditto.
50 Manilla Hemp Strings.
50 Dutch ditto.
5 Hanks, 200 turns, Salmon Twine, Dutch hemp.
5 ditto, 250 ditto.
4 Clews tarred light Sea Line.
4 ditto heavy ditto.
5000 Strings Dutch Hemp.
5 Strings Say Yarn, 300 turns.
A Bunch, 120 turns, Drag Twine for Pits.

ANDERSON, ABBOTT, & ANDERSON'S
BOOTS, TROUSERS, STOCKINGS, FISHING BROGUES, BAGS, COATS
ARE UNEQUALLED.

**TTEMANNE, C. J.**, Bergen op Zoom.
A Rocket-Shell Harpoon Gun.
A Rocket-Shell Harpoon.
A Drawing of No. 1 Section.
Ditto No. 2 ditto.

**EUWEN, D. VAN**, Basket-maker, Scheveningen.
A white Sole Basket with Cover.
A brown ditto.
A Turbot Basket with Cover.
A small Cod-Fish Basket, ditto.
A large ditto.
Two Baskets for washing Herrings.
A Spit Basket.
A white Basket.
A fine white Basket.
A white Red-Herring Basket with Cover.
A brown ditto.
A small (half-size) white Herring Basket with Cover.
A ditto brown ditto.

**IDNER, J. A.** (Firm: Kacks van de Velde and Co.), msterdam.
Cork Floats, for Silk Nets.
Ditto.
Floats.
Ditto.
Round Floats.
Ditto.
Square Floats.
Ditto.
Small Floats.
Salmon-Net Floats.
Lugger Floats.
Ditto.

**AS, A. E.**, Scheveningen.
A used Shrimp Net with Beam and Gear ready for Fishing.

**EPTUNUS" COMPANY**, Nieuwediep.
Model of a Lamprey-Tub.

**LLEN, DR. FRANÇOIS P. L.**, Scheveningen.
A Dragnet, with gear as used by the Bomboats of Scheveningen.


# NDERSON, ABBOTT, EN ANDERSON,

**37, Queen Victoria Street, Londen, Engeland,**

emers voor de Levering aan het Britsche Gouvernement, van GEWAST FEN KLEEDINGSTUKKEN, zooals deze worden gedragen voor Onderhe Mijnen en Torpedo Werken; ook van hunne Gebreveteerde wel afgete GEWAST TAFFEN KNAPZAKKEN, door hen ingevoerd en voor ebruik van het Britsche Leger aangenomen.

**BOTTEMANNE, C. J.**, Bergen op Zoom.
An Oyster Dredge for Deep-Water, not liable to foul.

**DIRECTION OF THE FISHERIES ON THE RI**
**SCHELDE**, Bergen op Zoom.
A Mussel Dredge.
A ditto Rake,
As they may be used according to the regulations in Zee

DIVISION III.

**Fishing craft of all nations; models and representatio**
**the same.**

Steam fishing-vessels and steam carriers.

**ROYAL COMMISSION FOR SEA FISHERIES.**
A Drawing representing an iron fish-lugger.

DIVISION IV.

Fishing vessels, and boats other than steam vessels.

**ROYAL COMMISSION FOR SEA FISHERIES.**
Model of a Sloop Fishing Boat.

**WUYSTER, M.**, Maassluis.
A Drawing: fisher-boat "Schokker," fishing with
common smelt net.
A Drawing: the same fisher-boat at anchor, drying the
at low water.
A Drawing: bownet fishery.
A Drawing: fishery with nets.

**OYAL MUSEUM "PRINS HENDRIK,"** Rotterdam.
Model of a Bom-Boat.
Ditto Hooker (Hoekerschip).
Ditto Fisher-Boat (Dutch: Botter).

**MIRREN, J. VAN,** Vollenhoven.
Model of a Fisher-Boat generally used on the Zuyderzee (Schokker).

**STERRE, J. S. VAN DER,** Vlaardingen.
Model of a Fishing Boat (Sloop).
Description of the Model of a Sloop Fishing-Boat, "Nyverheid," made at $\frac{1}{11}$ of the size of original by J. S. van der Sterre, Ship-builder, Vlaardingen.
This kind of boat, of which fourteen are found at Vlaardingen, is used for herring and ground-line fisheries, and may be distinguished from the luggers:—
1. Their depth of hold is 1½ ft. larger than those of the luggers.
2. That the bow is fuller built.
3. That the manner of building is quite different from that of the luggers, and the different parts are stronger; for instance, the draughts are closed and fixed together on the keel as well as in the hold, while the fence is composed of two-inch oak wood outside and inside, by which it is very rare that they are cut away by the sea, which happens frequently with the luggers.
4. Another difference is that they have a trunk or box to keep the fish alive; the holes in the bottom of the ship are crammed with stopples when the ship is used in herring fisheries.

With a few exceptions the mast can be taken down.
This kind of fisher-boat is a development of the old fashioned sloops, which were built with a flat poop placed upright against the stern, and which are still in use in some places for the ground-line fisheries only.
The great advantage of this alteration was that it gave more room for the mizen mast with rigging and sails.

**ZERMANS EN CO.,** Vlaardingen.
Drawing of a Fisher-Boat: "Hoekerschip."

**ANDERSON, ABBOTT, & ANDERSON,**
**37, Queen Victoria Street, Londen, Engeland,**
Uitsluitende Fabrikanten van de beroemde
**LEVE ANTIPLUVIUM WATERPROEF KLEEDINGSTUKKEN,**
VOOR IEDER KLIMAAT;
Waterproef Jassen en Beenbekleedsels voor Visschers; de ligtste stof, die in de Wereld wordt vervaardigd.

**"NEPTUNUS" COMPANY,** Nieuwediep.
Small flat-bottomed Fishing Boat, with fishing nets and gear as used for herring fisheries on the Dutch coast.

**KNOL, G.,** Middelburg.
Model of a Fisher-Boat: "Hoogaars," generally used on the river Schelde.

**ROYAL COMPANY FOR SHIPBUILDING AND ENGINE MANUFACTORY "THE SCHELDE,"** Flushing.
Model of a Fishing Boat (Vischbunsloep) for Ground-line Fisheries.
Model of a Fisher-Boat (Hoogaars).
Drawing of the Sails as used on No. 1.

**BOTTEMANNE, C. J.,** Bergen op Zoom.
Model of a Fishing Boat (Dutch: Weêr) for Herring and Anchovy-Fishing, as used on the East Schelde river.
Model of a Fishing Boat (Dutch: Hengst), commonly used for the Mussel Fishery, and worked generally by one man. This kind of boat is also used for shrimp-fishing on the West Schelde.
Model of a Fisher-Boat (Dutch: Schouw), was formerly very much used on the East Schelde river, but is being gradually superseded by the boat called "Hoogaars."
Anchovy-Fishing on the Zuyderzee with two fishing-boats (botters) with particular shaped nets. This kind of fishing is only allowed for three months in the year.

**MAAS, A. E.,** Scheveningen.
Model of a Cutter (Dutch: Maaskotter) $\frac{1}{20}$.

DIVISION V.

**Ropes and canvas suitable to fishing vessels.**

**PLANTEYDT, S.,** Krommenie.
A full Piece of Canvas, 33 meters long, 0·80 meters broad.

A full Piece of ditto, A 33 × 0·77⁵ meters.
Ditto, A B 33 × 0·77 meters.
Ditto, P 33 × 1·12 meters.

**ANDERSON, ABBOTT, EN ANDERSON,**
**37, Queen Victoria Street, Londen, Engeland,**
Beroemd in Canada, Australië, Nieuw Zeeland, de Kaap de Goede Hoop, Natal, Indië en China, als de eenig vertrouwbare Fabrikanten van GEWAST TAFFEN ARTIKELEN, die voor scheepsverzending zoo kunnen worden verpakt, dat ze, in een voor den handel geschikten toestand, op de plaats hunner bestemming aankomen.

**PLANTEYDT, S.**—*continued.*

Carded and hand woven from Dutch hemp, and bleached without chlorine.

A full Piece of Canvas, 33 × 0·80 meters.

Ditto, $\frac{A\,A}{M}$ 33 × 0·77⁵ meters.

Ditto, A B K 33 × 0·77⁵ meters.

Ditto, L^M 50 × 0·77⁵ meters.

Ditto, B 50 × 0·77⁵ meters.

Made from foreign hemp, machine carded and hand woven, bleached without chlorine.

## Division IX.

### Life boats, their equipment, and life-saving apparatus of every description.

**BOTTEMANNE, C. J.**, Bergen op Zoom.

Model of a Life Boat with Rocket-gun, for throwing a line over a wrecked ship without assistance of the ship's crew.

**MAAS, A. E.**, Scheveningen.

Model of a Life Boat invented by the Exhibitor. Built in this way the boat is ballasted by water and cannot capsize.

**ZACHARIASS, L. M.**, Helder.

Model of a Life Boat.

According to the opinion of different sailors at the Helder, a lifeboat of this model can more readily be used in the surf on the sandbanks because she is flat-bottomed, and passes more easily over the outer sands.

At the same time there is no difference between the poop and stern which makes turning needless, and thus lessens the chance of capsizing.

Instead of turning, the boat goes astern while every oarsman takes the seat of the man before him and keeps his own oar.

The boat is provided with boards for victuals, marked A and B.

$\frac{1}{10}$th of the real size, prize 200 guilders (Dutch currency) full size.

SPORTSMEN, TOURISTS, & OTHERS
Are invited to inspect the
STOCK OF INDIA-RUBBER & WATERPROOF ARTICLES
Of every description at
ANDERSON, ABBOTT, & ANDERSON'S
before purchasing elsewhere.

**LINDNER, J. A.** (Firm: Kacks van de Velde & Co.), Amsterdam.

Life Buoy Mattress, weight 3 kilog.; fit for bearing three persons; with a receptacle for victuals.

Life Buoy, in Linen, weight 1·7 kilog.; fit for one person.

Life Buoy, weight 2·6 kilog.; fit for bearing 11 kilogs. of iron after 24 hours' submersion (two men).

Lindner's Life Buoy, weight 3·5 kilog.; fit for bearing 14 kilog. of iron after 24 hours' submersion; with a receptacle for victuals.

The bread in the boxes of Nos. 1 and 4 is prepared in a special way, so as to hold nearly nothing but nutritious elements; and is made by Messrs. de Jonge and Doorakkers, Ships' Biscuits Manufacturers, Oude-Zijds voor burgwal 22, Amsterdam.

(Keeps three years when preserved in tin boxes.)

[FRESHWATER FISHING.]

DIVISION XIII.

## Salmon nets and fixed appliances for catching salmonidæ in all their varieties.

**WUYSTER, M.**, Maassluis.

Pit part of a Salmon Seine Net, viz. the middle net, and on both sides one set of two nets' length. This part of the Seine net is enlarged at both sides, with as many nets as allows the position of the fishing water. The way of joining is very simple; the nets are laced together, the cork- and ground-ropes are tied together.

A Pocket or Pit of a Seine Net. The enlargement is made in the same way as for salmon Seine nets.

Two large Salmon Bow Nets (used nets).

Two small ditto.

A Winter Salmon Drift Net (used net).

A Summer ditto.

A Shad Net (new).

A Drift Net, for small size fish (used).

A Flounder Drift Net.

Six Ground Lines, for Deep Water Flounder Fishing, with snoods and hooks.

**ANDERSON, ABBOTT, & ANDERSON,**
**37, Queen Victoria Street, Londen, Engeland,**
Fabrikanten van alle soorten van
GOM-ELASTIEK
voor Werktuigkundige, Wetenschappelijke en Huiselijke doeleinden; ook Fabrikanten van Lederen en Zeildoeken Slangen, Leder, Gom-Elastiek, der door ons Gebreveteerde CEROPILUM Gordels, Gom-Elastiek in bladen, Buizen, enz.

**ISTER, M.**—*continued.*
A Basket for Baited Ground Lines.
Two Eel Nets (used).
Three Pits for Eel Bow-Nets.
A Can for keeping Eels.
Four Lamprey Nets with Weel.
A Square Fishing Net (particular shaped model). This net is knitted as a round one from the beginning, and is squared by the ability and intelligence of the knitter by diminishing the stitches.
A Smelt Fishing Line.

**AS, A. E.**, Scheveningen.
A Large Cotton Seine Net, tanned.
A Cotton Seine Net, 2nd size.
Ditto, 3rd size.
Two Drift Nets for Salmon and Shad.

## Division XIV.

### almon rods, reels, lines, artificial flies and baits, gaffs, spears, creels, &c.

**KZWAGER, N.**, Cord and Twine Maker, Moordrecht.
A Rope used in Salmon Fishing, 180 meters, for landing the nets.
Nine meters of the same for trial.
A Rope used in Salmon Fishing, 90 meters.
Nine meters of the same for trial.
A Rope used in Salmon Fishing, 180 meters.
Six Small Lines (hook lines) used in Salmon Fishing, 72 meters.
Two Clews of Tuggel, used in Salmon Fishing, 108 meters.
6 Hanks of Yarn for Salmon Nets; 100 turns of Dutch hemp.
6 Hanks of Yarn for Salmon Nets; 140 turns of Dutch hemp.
6 Hanks of Yarn for Salmon Nets; 180 turns of Dutch hemp.
6 Hanks of Yarn for Salmon Nets; 200 turns of Dutch hemp.
6 Hanks of Yarn for Salmon Nets; 250 turns of Dutch hemp.
Two parcels of Dutch Hemp.
One parcel of Hatcheled Dutch Hemp.

ANDERSON, ABBOTT, & ANDERSON'S
SHING STOCKINGS AND BROGUES
Y LIGHT.] ALL IN ONE. [VERY STRONG.
7, Queen Victoria Street, London, E.C.

**DIRKZWAGER, N.**—*continued.*

One Sheaf of Dutch Hemp.

6 Hanks Yarn of Dutch Hemp; 140 turns, machine-carded, hand-woven.

6 Hanks Yarn of Dutch Hemp; 200 turns, machine-carded, hand-woven.

6 Hanks Yarn of Dutch Hemp, 250 turns, machine-carded, hand-woven.

## Division XVI.

### Pike, barbel, and other coarse-fish rods, reels and tackle, artificial spinning baits, &c.

**MAAS, A. E.**, Scheveningen.

A Drag Net.

A Cotton Square Net, with wooden cross and gear.

A Cotton Square Net, with iron frame for bait fishing.

A Cotton Square Fishing Net, with gear for bait fishing.

A Hemp Yarn Fishing Net, with gear.

Four Hemp Yarn Nets, for pike fishing.

Four ditto.

Two Perch Nets, new, tanned.

Two Ditto, untanned.

Two Bream Nets.

**SOOS, G.** Gouda.

Two Rigged Seine Nets, for pike fishing, tanned. Allow fishing at two meters depth,—length 12 meters.

Two Common Fish Nets, for river fisheries, tanned, length 12 meters.

A Square Net, four square meters, tanned, iron cross and pole.

A Triangular Bait Net, 1·5 meter, with wooden cross and pole, tanned.

A Pike or Tench Weel, with four wings, tanned, Dutch hemp, length 5·5 meters.

A Tench Weel without wings, tanned, Dutch hemp, length 1·5 meters.

**ANDERSON, ABBOTT, en ANDERSON,**
**37, Queen Victoria Street, Londen, Engeland,**
Fabrikanten van de beste
GEWAST TAFFEN KLEEDINGSTUKKEN VOOR LAND- EN ZEE-GEBRUIK;
ook van Gewast Taffen Paardenkleeden, Kar- en Hoolscheif-Kleeden en van hunne Geborstelde
Waterproef Weefsels voor Bedekking, Rijden en Rijtuigschecten.
GETUIGSCHRIFT.
Den Heeren ANDERSON & Co. Ministerie van Binnenlandsche Zaken, 3 September 1878.
Voor omstreeks zeven jaren hebt gij voor mij een Gewast Taffen Overjas gemaakt, die, onder
*sleet of* breuk, tot op dit jaar heeft dienst gedaan. (Geteekend) A. F. O. Lisser.

## Division XVII.

**Traps, nets, bucks, wheels, and all kinds of apparatus for catching eels, lampreys, &c.**

**KOLKE, J. VAN DER,** Kampen.
An Eel Weel, one wing.
Ditto, two wings. Both covered with paraffin varnish.

**VLIET, W. F. VAN** (Basket Manufacturer to the Court), 158 Noordeinde, the Hague.
An Eel Weel, with loose pits and wings.
An Eel Trunk.
A Perch Basket.
A Smelt Basket.
A Sole Basket.

**VISMAN, J.,** Isle of Texel.
A Silk Eel Weel.

**SOOS, G.,** Gouda.
A Small Seine Net, tanned and with leading poles, length 12 meters.
A Cotton Eel Weel, with three wings, untanned, length 9·5 meters.
A Cotton Eel Weel, with two wings with corks and leads untanned, length 7 meters.
A Cotton Eel Weel, with one wing, untanned, 4 meters.
A Cotton Eel Weel, tanned, 4 meters.
An Eel Weel, with two wings, with ground and drive riggings, untanned, made with first quality cord silk, 5·5 meters.

**SMIRREN, J. VAN,** Vollenhoven.
Two Eel Weels.
An Eel Pit.
A Float Cork for Eel Fishing.
A Hook for Pike Fishing.

**MAAS, A. E.,** Scheveningen.
A Cotton Eel Bow Net, with two wings and loose pit.
Ditto.
Ditto, small size.

ANDERSON, ABBOTT, & ANDERSON'S
**CAPE VENTILATING WATERPROOFS**
ARE UNEQUALLED.
37, Queen Victoria Street, London, E.C.

**MAAS, A. E.**—*continued.*

Ditto, one wing.
Ditto, with pit attached.
Four Separate Pits.
A Cotton Cast Net.
Ditto, smaller stitches.
Four Tench Nets.
Three Cotton Landing Nets.
Three Hemp Yarn Landing Nets.
Three Angling Rods of Portuguese cane with Angling Lines.
Two Angling Rods with Lines for smelt fishing.
A Hemp Yarn Bow Net.
Ditto, smaller.
Two ditto, with loose pit.
A Hemp Yarn Bow Net, attached pit.
Ditto, one wing.
Two Tench Nets, with wings.
Two Tench Tanks.
A Trident Eel Spear, with pole.
Ditto, used.
Two Hemp Yarn Bream Nets.
Two Nets, for small size fish.
Two Perch Nets.

## Division XIX.

### Anglers' apparel of every description.

**VLIET, W. F. VAN** (Basket Manufacturer to the Court), 138 Noordeinde, the Hague.

A Large Fish Basket or Creel.
A Hand Basket for Anglers.
A Hand Basket, for Seine-net fishing or dorser.
A Hand Basket, for square-net fishing.
A fine Hand Basket for Anglers.
An Easy Chair for watering places and Anglers.
Ditto, covered.
An Easy Chair with Fishing Gear.
An Easy Chair, "causeuse."

**ANDERSON, ABBOTT, & ANDERSON,**

**37, Queen Victoria Street, Londres, Angleterre,**

Renommés pour leurs TOILES VERNIES dans toutes les régions de la pêche du Canada, Terre-Neuve, Suède, Norvège, Hollande, France et des Iles Britanniques toutes entières.

## Division XX.

### Boats, punts, cobles, collapsible, portable, &c., in models or otherwise.

**UYSTER, M.**, Maassluis.
A Drawing, representing Salmon Fishing, with Bow Nets.
A Drawing—"Salmon Fishing with particular shaped Bow Net."

**OMPANY "NEPTUNUS,"** Nieuwediep.
A Fish Trunk.

## Division XXI.

**E POOLE, J. and A.**, Leiden, Manufacturers of Stuff for flags.

| | | | |
|---|---|---|---|
| No. 1. | One piece | 4/4 br. | Red. |
| „ 2. | „ „ | 4/4 br. | White. |
| „ 3. | „ „ | 4/4 br. | Blue. |
| „ 4. | „ „ | 3/4 br. | Red. |
| „ 5. | „ „ | 3/4 br. | White. |
| „ 6. | „ „ | 3/4 br. | Blue. |
| „ 7. | „ „ | 5/8 br. | Blue. |
| „ 8. | „ „ | half a yard broad. | Blue. |
| „ 9. | „ „ | „ „ „ | Black. |
| „ 10. | „ „ | 3/8 of a yard. | Blue. |
| „ 11. | „ „ | lighter stuff 3/4 of a yard. | Red. |
| „ 12. | „ „ | „ „ 3/4 „ „ | White. |
| „ 13. | „ „ | „ „ 3/4 „ „ | Blue. |

## Division XXV.

### Separation, preservation, and utilisation of fish, and all forms of life included in Class V.

For edible purposes—
Models of fish-curing establishments. Methods of, and models and other representations of any appliances for, drying, curing, salting, smoking, tinning, icing, &c.

**OMPANY "NEPTUNUS,"** Nieuwediep.
Model of a Smoking-Chamber for Herrings.


# NDERSON, ABBOTT, & ANDERSON,

**37, Queen Victoria Street, London, England,**

Lieferanten an die englische Regierung für OELHAUT-GRUBEN KLEIDUNG zum Gebrauch für unterseeische Minen und Torpedo Operationen; ferner für Patent OELHAUT TORNISTER, von ihnen zuerst eingeführt und jetzt Gebrauch in der englischen Armee.

**CARPENTER'S SCHOOL**, Harderwyk.
Model of a "Hang" for smoke-drying Herrings, at $\frac{1}{12}$ of the real size.

## Division XXVI.

**Fish dried, smoked, cured, salted, tinned, or otherwise prepared for food.**

**KIKKERT, H.**, Vlaardingen.
Salted Herrings, catch of October 1882. Superior quality.

**YZERMANS EN CO.**, Vlaardingen.
Salted Winter-Herring.

## THE HOOKER.

In sending a sample of our Hooker-herrings, caught last summer, to the Fisheries Exhibition at London, we beg to add some details concerning the Dutch Herring Fishery.

Formerly, vessels called Buizen (Doggers) were used, which were superseded by Hookers; but since (about) 1866 Loggers (Luggers) are the vessels which now nearly universally carry on the fishing. These being of a finer construction make quicker voyages, and are more adapted for the work than Hookers.

When Hookers flourished, strict laws regulated the Herring fishing, fixing the date of departure of the ships on the 15th of June which was called "Burzendag," and the previous Sunday was called "Vlaggendag," when the whole fleet lying in the harbour, fresh painted and flags gaily flying, presented a holiday appearance, thousands gathering together from the neighbouring towns and villages to admire them, expressing the general interest in the national enterprise. On the day appointed the vessels sailed for the Shetland Isles, but were not allowed to cast the nets before the 24th of June. The first take of Herrings by the fleet was sent home by the "Jager," a vessel noted for fast sailing and hired for that purpose by the owners of the Hookers. Its safe arrival gave rise to great rejoicing, and from the Herrings first landed, presents were sent to H.M. the King, and members of the

ANDERSON, ABBOTT, UND ANDERSON,
**37, Queen Victoria Street, London, England,**
Alleinige Fabrikanten für die Londoner Metropolitan Polizei zur Anfertigung von deren PATENTIRTEN WASSERDICHTEN POLIZEI-MAENTELN, wie solche von allen hauptsächlichen, englischen, irländischen und schottischen Polizeimannschaften getragen werden.

**'ZERMANS EN CO.**—*continued.*

royal family. Banquets were held of which Herrings formed the principal dish and even poets sang their praises:

> "Who first between his teeth
> The dainty morsel takes
> Enjoys a glorious treat."

The first Herrings frequently brought 700 guilders (about £60) per barrel, and were sold by small quantities from 2*s.* to 3*s.* a piece; in the year 1815 the first 195 barrels were sold for fr. 41,414—rather over £3450—thus averaging about £17 per barrel.

The laws regulating the time of fishing having been abolished, every one is free to commence when he thinks best; owing to the enormous supply the average quantity caught by Luggers is double that formerly caught by Hookers, to the greater advantage of the owners, as well as increasing the supply for general consumption.

The Herrings caught by Hookers in the North Sea (58°–60° Lat.) and prepared in the old Dutch manner, i.e. gutted and salted on board, are acknowledged to be much superior in quality, being more tender and fatter than all other kinds, preserving their agreeable flavour even till the following year. But fishing in these latitudes requires much patience and time, because the best Herrings are not always plentiful there during the summer.

The wages of the crew or men engaged in the Luggers being a percentage of the amount realised, they prefer quantity to quality; but those engaged on board the Hookers receive wages, thus adding to the trouble and expense of their equipment. Our firm is the only one in Holland having a Hooker engaged in the Herring fishing on the old principle. It is only owing to the rarity and value of Herrings thus brought to shore, that we generally realise double the price of Lugger-caught Herrings, and thus are repaid for our extra trouble and expenses.

**TEN HOUTEN EN DE RAADT,** Kralingsche veer.

Fresh and smoked Salmon.

Oysters.

---

**ANDERSON, ABBOTT, und ANDERSON,**

**37, Queen Victoria Street, London, England.**

Copie des schriftlichen Zeugnisses des Herrn Superintendent Kittle.

Bureau des Verwalters des Metropolitan Polizei-Districts,
4 Whitehall Place, S.W., 21. *Juli* 1869.

NEUE-MUSTER-MAENTEL.

Auszug des Berichts der Superintendenten über die Muster Mäntel, welche, am 7. Januar 1868, an die A, B, C, K, N und R Divisionen ausgetheilt wurden.

Die Superintendenten melden, dass die fraglichen Mäntel dem alten Muster bedeutend vorzuziehen sind, indem sie sich im Gebrauch gut gehalten haben, wasserdicht sind, und beim Zusammenfalten nicht brechen. Dieselben sind [illegible] für R Division noch in guten Zustand, und ist die Mannschaft der Meinung, dass dieselben bei weitem die besten [illegible] sind, welche jemals zum Di ist ausgegeben wurden. Die R Division betrachten No. 2 Muster als etwas besser als No. 1.

(*Ges.*) Thos. Kittle, *Superintendent.*

**SMIRREN, J. VAN,** Vollenhoven.
A Bottle of Shrimps, in vinegar.
Ditto, in salt.
A Bottle of preserved Eels.
Ditto, Anchovy.

## FISH CULTURE.

### Division XXXV.

**Models or drawings of fish-hatching, breedin rearing establishments, including oyster and other fish grounds; and all apparatus and implements con with the same, and for transporting fish and fis Food for fry.**

**DUTCH SOCIETY FOR PROGRESS AND IMPR MENT OF OYSTER CULTURE,** Bergen-op-Zoom vince of Zeeland.
Five Models of Oyster Tanks in Zeeland.
Different Apparatus for Keeping Young Oysters (Nurs
Tiles prepared for Collecting Spat.
Dredges for Oyster Fishing.
Implements, viz.,

*a.* Different sorts of Knives for detaching the young from the chalked tile.
*b.* Tile Scrapers.
N.B.—When the young oysters have been det the tiles are scraped clean to serve anew
*c.* Tanks to hold the clean tiles for immersion in the mixture.
*d.* Shovel, as used in the tanks for shifting and man ing oysters for sale.

**FISHERIES COMPANY "DE WEMELDINGS COMPAGNIE,"** Wemeldinge, Zeeland.
Frame-shaped Collectors, with stone "cornishes," us oyster culture.
Iron Board for Brood Oysters, used instead of the wooden for damaged young oysters.

**MASSEE, J. C., & SON,** Goes.
A Set of Zinc-Pans for Oysterbrood.

**NOORDHOEK HEGT, J.,** Apeldoorn.
Model of the Locality of Salmon Breeding.
Gratings for the Salmon-Eggs.
Plan of the whole Locality representing the situation of 50 Streams and 90 Fish-Ponds, nearly all in use.

**ORDHOEK HEGT, J.**—*continued.*

Salmon (salmo-salar), cultivated at the "Zwaanspreng," of different ages (in spirit), viz.—
Salmo-salar Salmon, 4 years old.
Ditto, 3 years.
Ditto, 2 years.
Ditto, 1 year.
Ditto, 9 months.
Ditto, 6 months.
Ditto, 3 months.
Ditto, 1½ month.
Ditto, 3 weeks.
Ditto, 1 day.
Ditto, breaking shell.
Salmon from California (salmo quinat), in different size, with the young fish (in spirit), viz.—
Salmo quinat, Californian Salmon, 4 years old.
Ditto, 3 years.
Trout, of different size, and young fry of the same; second brood from "Zwaanspreng" (in spirit), viz.—
Trutta lacustris, Lake Trout, 3 years.
Trutta lacustris, Lake Trout, 2 years.
Trutta fario, Brook Trout, 3 years.
Ditto, 2 years.
Ditto, Common Trout, 3 years.
Ditto, 2 years.
Trutta trutta, Salmon Trout, 2 years.
California Trout (salmo fontinalis), viz.—
Salmo fontinalis, American Trout, 2 years.
Ditto, 1 year old.
List of Eggs or ova.
Salmo salar.
Salmo quinat.

Trutta lacustris.
Trutta fario.
Trutta trutta.
Trutta fontinalis.

All the fish named in this list were hatched and reared at the establishment *Zwaanspreng at Apeldoorn in the Netherlands.* Established 1878.

The following reproductions have been obtained, viz.—
Salmo quinat.
Salmo fontinalis.
Trutta fario and hybrids.

## Division XXXVI.

### Representations illustrative of the development and gressive growth of fish.

**MAJU,** Amsterdam.

(Microscopic specimen, showing the gradual development c the salmon.)

The Embryo, just appearing.
The Embryo, aged four days.
Ditto, seven days old.
Ditto, twelve days.
Ditto, sixteen days.
Ditto, twenty-five days.
Ditto, thirty-five days.
Ditto, forty days.
Ditto, forty-three days.
Remarkable aberrations.

## Division XL.

Physico-chemical investigation into those qualities of salt and fresh w which affect aquatic animals; investigation of the bottom of the sea and of la shown by samples; aquatic plants in relation to fishing, &c.; researches into aquatic fauna (animals of the several classes preserved in alcohol or prepa &c.); apparatus and implements used in such researches.

**DUTCH SOCIETY FOR PROGRESS AND IMPRO MENT OF OYSTER CULTURE,** Bergen-op-Zoom, province of Zeeland.

A Collection (in liquor) of the Fauna of the River Sc Zeeland), collected and prepared by Dr. P. P. C. Hoek Dr. R. Horst, of the University of Leyden.

**THE ZOOLOGICAL SOCIETY OF THE NETE LANDS.** (Established at Rotterdam May 15, 1872. Sta approved by Royal decree of March 14, 1876, No. 32.)

A. *Specimens in Alcohol.*

Collection of Fishes, belonging to the Dutch Fauna, collected along the sea-coasts of the Netherlands a Dutch rivers, lakes, &c.

Collection of invertebrate Animals, belonging to the I Fauna.

B. Model of the Zoological Station of the Zoological Sc the Netherlands. The building was constructed in 187 has been used for zoological investigations during the sur months of seven e years. The building was t down every autr uilt towards the summer o

**THE ZOOLOGICAL SOCIETY OF THE NETHERLANDS**—*continued.*

following year. The station was erected at the following places, respectively:—

| | |
|---|---|
| In the year 1876 . . . . | Helder. |
| In the year 1877 . . . . | Flushing. |
| In the years 1878 and 1879 . | The Island of Terschelling. |
| In the year 1880 . . . . | Nieuwediep. |
| In the years 1881 and 1882 . | Bergen op Zoom. |

C. Large Diagrams.

The Interior of the Entrance to the Station.

The Apparatus for circulating Water in the Tanks, as they are in use at the station.

Horizontal and vertical Sections of the Station.

Representation of the Anatomy of the Oyster, in six figures, according to the latest investigations, made in the station.

Representation of the Embryology of the Oyster, in ten figures, according to the latest investigations, made in the station.

D. Publications of the Netherlands' Zoological Society.

The Journal of the Society. Vol. I.–V., 1874–1881. Vol. VI. 1, 1882.

Supplementary Vol. I. of the Journal. First part. Report of the investigations relating to oyster-culture. (Dutch and French text.)

First-Seventh Annual Report of the Zoological Station of the Netherlands' Zoological Society, 1876–1882.

E. A Collection of Books and Papers, published in the Netherlands by Dutch authors, important for the Fauna of the Dutch rivers and seas.

## Division XLVI.

(δ) Mollusca of all kinds and shells not included in Class III.

**DUTCH SOCIETY FOR PROGRESS AND IMPROVEMENT OF OYSTER CULTURE**, Bergen-op-Zoom, province of Zeeland.

a. Tiles with adhering Spawn.
b. Living Oysters.
c. Sundries.

**POLLEN, DR. FRANÇOIS P. L.**, Scheveningen.

V. Conchylies from Madagascar.

Cytherea lineolata, Sow.
Tapes geographica, Chemn.
Circe divaricata, Lam.
Arca maculosa, Reeve.
Arca Sp.
Arca velata, Sow jeune.
Perna rudis, Reeve.
Bulla striata, Brug.
Haliotis nebulata, Reeve.
Phasianella aethiopica, Phil.?
Cyclostoma vittatum, Sow.
Cyclostoma Michaudi, Gratel
Turbo fraconicus, Reeve.
Nerita undata, Linné.
Nerita polita, Linné.
Nerita Rumphii, Reel.
Melania mitra, Reeve.
Cyclostoma Sowerbyi, Pfr.
Achatina panthera, Fer.
Ampullaria nsp.?
Cerithium asperum, Brug.
Fusus toreuma, Reeve.
Terebra monilis, Quoy.
Terebra oculata, Lam.
Mitra vulpecula, Lam.
Conus mutabilis, Chenum.
Conus gubernator, Brug.
Conus textile, Linné.
Conus verriculam, Reeve.
Cypraea onyx, Linné, *a*, *b*, and *c*.
Cypraea caurica, Linné.
Cypraea cernica, Sow.
Oliva irisaus, Lam.
Oliva elegans, Lam, *a* and *b*.

## Division XLIX.

(*h*) Perfect insects and larvæ of insects, which are destroyers of spawn or serve as food for fish.

**KOLKE, J. VAN DER**, Kampen.

Some Specimens of Water Insects spoiling the nets in rivers.

Gammarus Pulex L. and Lemmopholus rhombicus L.

## Division L.

(*i*) Crustacea of all kinds.

**POLLEN, DR. FRANÇOIS P. L.**, Scheveningen.

IV. Crustacea from Madagascar.

Eriphia Smithii, Mackley.
Neptunus madagascariensis, Hoffm.
The Forceps of Neptunus madagascariensis, viewed from above.
Ditto, viewed from below.
Thalamita Helleri, Hoffm.
Second Pair of Legs of Palaemon mayottensis, Hoffm.
Palaemon mayottensis, Hoffm.
Palaemon alphonsianus, Hoffm.
Second Pair of Legs (left) of Palaemon alphonsianus.
Ditto (right) ditto.
Palaemon reunionnensis, Hoffm.

I, DR. FRANÇOIS P. L.—*continued.*
d Pair of Legs of Palaemon reunionnensis.
mon longimanus, Hoffm.
d Pair of Legs of Palaemon longimanus.
soma dubium, Hoffm.
Forceps of Goniosoma dubium, viewed from above.
, viewed from below.
da cordimana, Latr.
; part of the body of Ocypoda cordimana, Latr. 2|1.
Forceps of Ocypoda Ceratophthalma fab., viewed from ve.
Forceps of Ocypoda Ceratophthalma (male), viewed from ow.
le Specimen, without trace of the elevated ridge.
; Part of Ocypoda Ceratophthalma.
sus strigosus, Latr.
sus Pharaonis, Milne Edw.
Forceps of Grapsus Pharaonis, Milne Edw., viewed from ve.
, viewed from below.
urus Ehrenbergi, Heller.
Forceps of Matuta distinguenda, Hoffm. (male), viewed m above.
, viewed from below.
men.
ta distinguenda, Hoffm. (female).
(male individu).
mon madagascariensis, Hoffm.
mon parvus, Hoffm.

## Division LI.

### (*k*) FISH OF ALL KINDS.

N, DR. FRANÇOIS P. L., Scheveningen.

II. Fishes from Madagascar and Réunion.

rops dodicauthus, Blkr.
ia oligacanthus, Blkr.; Glyphidion Rhyncholepis; Blkr.
retroplus van Dami, Blkr.
ephelus Polleni, Blkr.
mmistes ocellatus, Blkr.
topterus pristipoma, Blkr.
us vergeri, Blkr.; Gobius Samberanoensis, Blkr.; Parauneus multifasciatus, Blkr.
ephelus Retouti, Blkr.; Rhombotides Polyzona, Blkr.
s aspilus, Blkr.; Alticus monochrus, Blkr.; Lutjanus inquelineatus, Blkr.

**POLLEN, DR. FRANÇOIS P. L.**—*continued.*

III. Fishes from Madagascar and Réunion.

Gobius polyzona, Blkr.; Chaetopterus microlepis, Blkr.
Lutjanus octovittatus, Lutjanus bengalensis, Blkr.
Gobius melanopterus, Blkr. et Gobius macrorhynchus, Blkr.
Gobius isognathus, Blkr. et Cirrhites punctatus, Cuvier. Poissons de Madagascar.
Myripristis corbonicus, Cv.
Mugil cephalotus, val et Balistes calolepis, Blkr.
Anthias Borbonier, Günth et Paratilapia Polleni, Blkr.
Caesio xanthurus, Blkr.

**WUYSTER, M.**, Maassluis.
A bottle, containing two Smelts of very large size, caught with the line in 1878.

DIVISION LV.

**Works of Ichthyology. Maps illustrating geographical distribution, migration, &c., of fishes and spawns.**

**HOFFMANN, PROF. C. K.**, Leyden.
Zür ontogenie der Knöckenfische.

**DIRECTION OF THE FISHERIES ON THE RIVER SCHELDE**, Bergen op Zoom.
A Map of the Province of Zeeland on which are marked in colours the different Fishing Grounds for Oyster and Mussel Culture and Bow Net Fisheries.
Two Maps showing the Fishing Ground leased by the Government at different times.

**POLLEN, DR. FRANÇOIS P. L.**, Scheveningen.

I. Fisheries of Madagascar, &c.

Shark Fishing by Night (Réunion).
Symbou Fishing of Malgache Women.
Wear Fishing (Madagascar).
Seine Net Fishing (Madagascar).
Hand Line Fishing by Night (Madagascar).
The Basar at Hellville (Nossi-bé).
Turtle Fishing (Madagascar).
Fish Merchant at St. Denis (Réunion).
Coral and Shell Fishing (Madagascar).
A Book entitled: "Poissons et Pêches de Madagascar et de ses Dépendances, par P. Bleeker et François P. L. Pollen, 4°. 32 planches coloriées et une carte."

**ER, Mrs.**, the Hague.
s ichthyologique des Indes. Orientales Neêlandaises par Dr. P. Bleeker.

**TER OF THE FINANCES**, the Hague.
rs and maps on salmon propagation and salmon fisheries Dr. François P. L. Pollen.

**RY OF THE FINANCES, THE HAGUE.**

. François P. L. Pollen's Drawings on Salmon and Salmon Fisheries.

evelopment of the male and female generative products of e Rhine Salmon (Salmo Salar).
evelopment of Salmon eggs after fecundation.

ung Salmon (Parr-stage), aged two months.

ung Salmon (Salmo Salar jud) one year old.

oung Salmon (Salmo Salar jud) (Smolt) at the period en it travels down to the sea for the first time.

lmo Salar (black-tail stage, Dutch Schotje) returning to river for the first time.
lmo Salar, older stage.
lmo Salar, dwarf-form, further advanced stage.

rence between Salmo Trutta and Salmo Salar.

called St. Jacob's salmon, at the period when it is for the t time fit for breeding.
called St. Jacob's salmon, older stage.
-called May salmon (Salmo Salar), further advanced ge.
called Gray salmon, September to December. The male mon in the spawning season.
-called Gray-salmon, September to December. The ale salmon in the spawning season.
lled Hengst (Stallion) salmon. February to May.

er Salmon. October to February.
Trutta L.
lled Schot or Hone Salmon (Salmo Trutta, var.)
lled Schot or Hone Salmon (Salmo Trutta).
(Salmo fario) Dutch Beekforel.
onus Oxyrhynetus, Dutch Pouting of Adelvisch.

**MINISTERY OF THE FINANCES OF THE HAGUE-** *continued.*

Smelt, Salmo eperlanus, Dutch Spiering.
Young Shad (Alosa vulgaris), Dutch Eels.
Ripe Female Shad (Alosa vulgaris).
Shad after spawning, on its way back to the sea.
Grey Mullet (Mugil shelo) Dutch Harder.
Sturgeon (Acipenser Sturio) Dutch Stem.
Salmon Seine-Net Fishery, Klein Profijt.
Ground Plan of the Salmon Seine-Net Fishery, the Kykuit.

Ground Plan of the Salmon Seine-Net Fishery, the Goede Verwachting.
Salmon Seine-Net Fishery, Kykuit.
Salmon Seine-Net Fishery, Goede Verwachting.

Salmon Seine-Net Fishery, near Sliedrecht.
Salmon Seine-Net Fishery, near De Groote Lindt.

Salmon Seine-Net Fishery, near Ammerstol.
The interior of a Salmon Fisher's Hut.
Winter Drift-Net.
Sketch of the way in which Fishing with Salmon Seine-Nets is carried on.
Salmon Seine-Net Fishing on the German Rhine.
Salmon Fishing with Drift-Nets.
Salmon Fishing with Stake-Nets.
A Trench Salmon-Net with three pits.
Pocket-Nets of the Solway Firth.
Stake-Nets of the Solway Firth.
Bleak Fishing with Fence-Nets.
Stake Fishing.
Fishing with Pit-Nets.
Eel Fishing.
Fishing with Hand-Lines.
Eel Fishing with the Line.
Weel for Lampreys.
Salmon Traps.
Fish Culture.
Map of Germany.
Map of the so-called Zuid Hollandsche Waard, inundated in 1421.

## DIVISION LX.

### Reports, statistics, and literature of fish, fishing, and fisheries.

**OLLEN, DR. FRANÇOIS P. L.,** Scheveningen.

Seven years of the General Fisheries Newspaper under editorship of François P. L. Pollen, 1869–1875.

Album, with different Photographs of exhibits relating to the Fisheries, from the Exhibition at Berlin, 1873, entitled: Erinnerung an die Erste Ausstellung von Geräthsschaften und Produkten der See-und Binnenfischerei in Berlin, 1873."

"Erinnerung an die Internationale Fischerei Ausstellung zu Berlin im Jahre 1880.

A Dutch paper entitled: "Is the Contract between the States on the River Rhine concerning the Common Regulations of the Rhine Fisheries Advantageous for the Netherlands?" A question answered by François P. L. Pollen, 1870, 8°, 32 pages. The German translation has been published in Circular No. 3, 1871, pag. 19–33, of the Deutsche Fischerei-Verein at Berlin.

**OYAL COMMISSION OF SEA FISHERIES.**

The yearly reports concerning the Netherlands' Fisheries, drawn up by the Royal Commission of Sea Fisheries since 1857.

Diagrams, Curves and Statistical Tables concerning the state and the progress of the Netherlands' Fisheries.

**OYAL DUTCH METEOROLOGICAL INSTITUTE,** Utrecht.

A Set of Papers concerning Herring Fisheries compiled from observations of fishermen by the Royal Dutch Met. Institute.

**nstruments, &c., for Forecasts of the Weather and for Storm Warnings.**

The Aeroclinoscope (Model) $\frac{1}{20}$.

This instrument has been erected in the seaports of the Netherlands on a place visible to ships in the roads, for showing to captains the direction of the observation places, with highest and lowest barometrical pressure, and the amount of difference between these two places at 8 a.m.

This will enable them to make the prognostics of the expected wind and weather themselves, by means of the law

## ROYAL DUTCH METEOROLOGICAL INSTITUTE—*continued.*

regulating the connection between barometer difference and wind.

This law, generally called the "Buys' Ballot" law, because Professor Buys Ballot, the superintendent of the Royal Dutch Meteorological Institute at Utrecht, found it after long researches, states: "The air moves around the place with lowest "barometer pressure from right to left on the Northern, and "from left to right on the Southern hemisphere."

An observer placed in the line between the two places with highest and lowest barometer pressure, and looking towards the latter, will have the wind from the left hand on the Northern hemisphere, and from the right hand on the Southern.

This law was first communicated by Prof. Buys Ballot in the meeting of the Royal Academy of Science at Amsterdam in October, 1857, and published in the annals of the Met. Institute of 1858, and in several foreign scientific papers.

Since that date it was generally known, as can be shown from the U.S. Senate papers, Fifth Congress, May 6th, 1858, when the questions about Meteorological researches of the Lake districts were discussed.

Upon this law are based all the weather charts and storm warnings from the several Met. offices in the present time.

The system still used in the British Isles of giving warning of probable storms or strong winds by hoisting cones or drums in the seaports was abandoned fifteen years ago, because it seemed more practical to induce captains to make the prognostics themselves.

The instrument itself consists of an iron pole, having a balance-shaped cross-beam at the top, which can be moved in the vertical plane by a long iron rod fixed at the end of the cross-beam.

This iron pole is fixed to a wooden one, and can be turned round its own axis by a handle at the lower end in order to put the cross-beam in the direction of the observing places with highest and lowest barometer pressure, while an inclination is given to the cross-beam according to the amount of barometric difference between these two places.

A red-painted globe of iron frame-work hangs on the northern arm of the cross-beam to distinguish it from the southern when at a distance from the instrument.

Wooden Case for Weather Reports. (Model ¼.)

This case is an annex to the aeroclinoscope. For those captains who might like to investigate the question, the

**ROYAL DUTCH METEOROLOGICAL INSTITUTE—** *continued.*

readings of the barometer and thermometer, direction and force of the wind, on the three last days at the principal places of Europe, are exhibited every day close to the instrument, thus giving a general view of the movements of the atmosphere over Europe.

A Set of Instruments, as provided to ships in general, as:—
One mercurial barometer.
One Aneroid barometer.
One psychrometer.
Three Thermometers for Surface Temperature.
One set of aerometers.

# NORWAY.

LIVING in a country whose soil was poor, and surrounded by the sea, the Norsemen, immediately after their immigration from the south or the east, began to utilise this sea, which abounded in fish of different species. But fishing did not satisfy them long; the riches of the southern countries drew their minds towards these happier regions; the woods, which covered their mountains and hills, offered them the principal materials for attaining the fulfilment of their desires; and at the same time when the history of Norway begins in the eighth century, the annals of Germany, England, and France, mention the Norse Vikings as plundering their coasts. In the following century we find them in Ireland, where they founded several states under their chiefs (sea-kings), and in the Mediterranean, and in 870 they discovered and peopled Iceland. From here they went to Greenland; and in the year 1000 Leif Eiriksson and his followers established themselves in Massachusetts, which they called *Vinland*. But the Norse colonists could not resist the great number of natives, and being moreover at variance they soon returned to Iceland, from whence they seem to have kept up communications with the new world for the next forty or fifty years.

In the middle ages the mighty Hansa-confederacy ruined the Norwegian shipping-trade, but rather improved the fisheries by improving the commerce of fish produce exported all over Europe.

In the seventeenth century and later, the shipping as well as the fisheries, successively, had developed considerably; and at present, according to the last census, from 70,000 to 90,000 persons, or 11 per cent. of the whole population, are employed in the fisheries, and about 50,000 persons, or 7 per cent., in the shipping trade.

In many districts, the building of boats for the fisheries is of some importance. In the boats there is a great variety of forms, according to the waters they have to cross and the different kinds of fishery for which they are intended. The visitors to the Exhibition will find a large collection of models of boats in the Norwegian department.

As early as the ninth century, the history of Norway mentions the importance of the Westfjord cod fisheries, describing the Lofoten islands as the principal station. There has never been any record of the non-appearance of codfish at this part of the coast in the season, the quantities varying from miles of shoals to lesser quantities.

The herring fisheries were at one time of almost as much importance for the Norwegian commerce as the cod fisheries. At present the winter or spring herring fishery is of little importance, amounting to scarcely 30,000 barrels a year, while the summer or fat-herring fishery produces an average of 600,000 barrels of pickled herrings annually.

The salmon, trout, lobster, mackerel, and sprat fisheries are of minor importance, the aggregate value being but 1,700,000 kroner, or £93,000 yearly, while the cod and herring fisheries yield the fishermen 21,500,000 kr., or £1,180,000 a year.

## THE GREAT COD FISHERIES.

### The Lofoten Cod Fishery.

Lofoten is the name of a group of islands extending south west from the main land from 68° 36′ to 67° 25′ and forming with it the great Westfjord. The permanent population of these islands is scarcely more than 25,000, supported chiefly by fishing. We find however, on some of the larger islands, very good and well kept meadows. Besides the dwellings of the permanent population, there are in every bay which is in any degree protected from the ocean, a number of huts which the proprietors, who are frequently merchants and fishermen, have built, and let out to fishermen from other places during the season. These huts, which usually are arranged for one or two boats' crews, six to twelve persons, consist of only one room with plank beds along the wall, and another room for keeping the nets, cords and lines, barrels for the roe and oil, and the provisions and clothes of the fishermen.

The codfish are taken in Lofoten in three ways, namely, with hand-lines, with long-lines, and with gill-nets. It is generally the poorest fishermen who use hand-lines only. Their catch amounts on the average to 50 fish daily for each man; sometimes however they get from 100 to 120. For bait they use fresh or salt herrings; and when these are not to be had, pieces of codfish or its roe.

A boat equipped for long-line fishing is from 36 to 40 ft. long, 9 to 10 ft. wide, and 3 ft. deep, has at least six sets or 24 lines, each with 120 hooks, 6 or 8 ft. distant, on fine snoods of hemp or cotton, 16 to 20 in. long. The bait is the same as in hand-line fishing. At the time prescribed by the officers in charge of the Fishing Stations, usually in the afternoon, and only at the places they appoint, the lines are set, with from 500 to 2400 hooks, according to the number of the crew and to local circumstances. If the fish rise from the bottom, the lines also are raised to the same height by means of glass floats. On the following morning the lines are taken up. If the fish are near the coast, and not much time is required for rowing out and back, the fishery with long-lines may take place during the day. The proceeds of this fishery are of course very variable. On the average it may be taken from 50 to 60 fish daily per set (Bak).

The boats equipped for fishing with gill-nets have generally 30 to 35 nets on board. The width of the nets varies from 15 to 20 fathoms; the length, between 25 and 60 meshes, measuring from 80 to 95, and sometimes 95 to 100 millimetres between the knots on each side. The nets are kept upright in the water by floats of hollow glass (an invention by Mr. Christopher Faye in Bergen), wood, or cork.

A catch of between 400 and 500 cod is considered satisfactory. If the take exceeds 600 to 800 fish, the fishermen are obliged to leave part of the nets in the sea until the afternoon, as the boats can seldom hold a larger number of fish besides the nets and the crew.

The catch of codfish for the years 1876–82, for Lofoten, in the season, *i.e.* from January to April or May, was an average, 26·3 millions fish. The number of fishermen, 26,309, with from 6500 to 6800 open boats.

### The Other Large Cod Fisheries.

While great shoals of cod come into the Westfjord, others, in order to spawn, seek the banks on the outside of the coast from the 69th degree of latitude to

the North Cape. Small shoals of cod with roe and milt appear up to Vardo. But this is generally of small importance in comparison with that of the so-called capelin fishery.

At the end of February—sometimes earlier—the appearance of millions of gulls (Larus glaucus, Larus eburneus) and the blowing of a number of whales on the surface of the ocean, in the vicinity of the North cape, or frequently somewhat more to the east, announces that the small capelin (Mallotus villosus, Osmerus arcticus) the favourite food of the codfish, is approaching the coast; and the codfish follow in immense masses. Towards the end of May, the capelin usually retire to the ocean, accompanied by the masses of cod, which the fishermen pursue to a distance of some miles from the coast. But in the Varanger fjord they sometimes remain until June. The average catch for the years 1876 to 1880 is calculated at 15·3 millions of cod, for on the coast of Finmarken, the number of fishermen being over 14,000 and of the open boats over 4000.

From January or February to April or May, the cod fishery is also going on from open boats, and partly from decked vessels, along the coast of Romsdal, Sondmore, and Nordmore (between Cape Stat and Trondhjem). The catch of the season was on an average, for the years 1876–80, about 7·5 millions of cod, making a total for all the three cod fisheries mentioned above an average of 49·1 millions of cod in the *winter* and *spring* seasons.

The catch of cod, ling, cusk, coalfish, and haddock, in the *summer* and autumn is of less importance, and so is the catch of cod in winter and spring at stations other than the above-mentioned parts of the coast. If all these fisheries are put together, the amount of fish caught will be pretty large, as it yields an average *export* of dried and dry-salted fish of 75,000,000 yearly, which would answer to about 375,000 tons of live fish.

## THE HERRING FISHERIES.

The annals of Norway mention that in the first half of the sixteenth century the fishery of *winter* herrings took place on a large scale in the neighbourhood of Bergen, while towards 1567 the fish did not visit these coasts.

It is supposed that the herrings were again there in the seventeenth century; but it is known that from 1650 to 1654 there was no fishery.

In all probability the fishery did not recommence before 1699 or 1700, and from this time it was carried on uninterruptedly until 1784, although with extremely variable results. In the year 1784 the herrings again deserted the coast, and did not reappear until 1808. From this year to 1870, the winter herrings have constantly visited the coast in great masses; yet a remarkable decrease was noted in the last named year. At present there are scarcely more than 25,000 barrels of spring herrings caught at the old stations.

The shoals of herrings which selected the coasts south of Bergen for their spawning place, usually moved from south to north, from Skudesmaa fjord to Selbo fjord, both along the outside of the islands and among them. The shoals which had their spawning ground to the north of Bergen, moved on the contrary from north and south from Bremanger to Fensfjord; others touched somewhat later on the environs of Cape Stat and the Søndmør coasts.

The herring was caught by gill-nets and sweep-nets, or large seines, a gill-net boat being furnished with from 20 to 40 or 60 nets of about 12 to 15 fathoms long and 100 to 120 meshes deep, the size of the meshes being 28 to 31 *millimetres* between the knots. With the large seines were 3 boats, and 20 to 25

men employed, the seines being 100 to 150 fathoms long, and 20 to 30 fathoms deep, or less, that is from 80 to 100 fathoms long, and 15 to 20 fathoms deep. Gear and boat would cost £400 or £500.

The number of fishermen employed on the fishery is about 25,000 to 30,000 with 6000 open boats, and, if the crews of transport vessels, working people, and coopers are counted, there would be at least 50,000 persons. The total catch for the season average 600,000 to 800,000 barrels. In the last years the summer herring fisheries have become the most important, almost taking the place of the winter fishing.

In July the summer-herrings are usually found somewhat more towards the north, in Søndfjord, Nordfjord, Romsdal, and afterwards in Nordmøre in the Trondhjem fjord, in the Namsen fjord, also along the coast of the province of Nordland, and even up to Finmarken.

The shoals of summer-herrings are very irregular; but no year is known in which some tracts of the coast mentioned has not been visited by larger or smaller shoals of them. The herrings caught in August and September are most esteemed; for then not only is the flesh still very fat, but the lining fat is also firm and will keep well. Later in the autumn the lining fat decreases and is replaced by milt and roe. At the end of November this fishery usually ceases; but in several of the deeper fjords, such as the Trondhjem fjord, Namsen fjord, and Eidsfjord in Vesteraalen, the herrings often remain till January. But at this period the herrings are very thin and dry, and are chiefly used as bait for cod-fishing.

The gill-nets used for this fishery are usually from 15 to 50 fathoms long, 200 to 250 meshes deep, and the meshes 23 to 27 millimetres between the knots. Large seines or sweep-nets are also used to a considerable amount.

There are no exact statistics of the catch; it has given annually an export of from 500,000 to 600,000 barrels of pickled herrings as an average for the years 1877–80, and has employed 35,000 or 40,000 fishermen.

Of other fisheries on the coast, of some importance to the population, there are the sprat, the mackerel, the salmon, and the lobster fisheries; these will, however, altogether not exceed 7 per cent. of the value of the Norwegian *coast-fisheries*, just mentioned.

The fisheries for supplying the local fresh-fish markets of Norway are not yet subject to any statistical record.

The *deep-sea* fishery in the North Sea is still a trifling one as far Norway is concerned, but the whale-fishery by steamers on the coast of Finmarken has become rather large of late years, employing in 1883 over 20 steamers, and yielding last year a catch of 386 whales.

Combined *fishing and hunting* expeditions are carried on by about 80 decked vessels in the Arctic Sea and on the coast of Spitzbergen; the result last year was half a million of codfish, 6000 seals, 148 walruses, 49 ice bears, 260 reindeer, etc., amounting in value to £140,000. The *sealing* or seal-hunting by steamers in the Arctic Sea is another trade that last year was carried on by 15 steamers of an average of 259 tons, and gave a result of 100,000 sealskins and 19,000 barrels of fat and oil.

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Further particulars respecting the trade and commerce of the country will be found at the head of Class III. as statistical notes on the exports from Norway.

## LIST OF EXHIBITORS.

### CLASS I.—SECTION I.

### FISHING.

[SEA FISHING.]

DIVISION I.

**Gear of every description and of all nations used in trawl, herring, long line, hand line, and every other mode or system of fishing, including all nets, lines, hooks, harpoons, tackle, &c., employed in the same.**

**AALESUNDS SLYNGEFABRIK,** Aalesund (Owners: P. D. Stafseth and Kraasby Brothers), Manufacturers of Handlines, Lines and Snoods of Hemp, Cotton, Linen, and Silk. Export. *Awarded*—Philadelphia, 1876, Medal; London, 1877, Medal; Paris, 1878, Medal; Berlin, 1880, Silver Medal; Edinburgh, 1882, Silver Medal.

Handlines and Snoods.
Braided, Tapered, and Twined Snoods.
Samples of Goods.

**DAHL, IENS O.,** Hanø.

Different Cod Gill Nets, as used at the Lofoten cod fisheries.

Long lines for the same fisheries, 8 different kinds.
Hand lines, Iigs and Drails, for Codfish, Coalfish, Haddock, &c.

**FAGERHEIMS MEK. NOT-OG GARNFABRIK,** Bergen. Manufacturers of Seines and Nets, in complete order; established 1873. Exporters to Sweden, Denmark, Russia, &c. *Awarded*—Viborg, 1875, Bronze Medal; Paris, 1875, Silver Medal; Norrkoping, 1876, Great Silver Medal; Philadelphia, 1876, Medals for Nets and Seines, very well constructed, double knotted, and of good material; Paris, 1878, Bronze Medal; Berlin, 1880, Gold Medal.

THOMAS BLAND & SONS,
Gun and Rifle Manufacturers and Merchants,
106, STRAND, LONDON;
AND LIVERPOOL AND BIRMINGHAM.

**FAGERHEIMS MEK. NOT-OG GARNFABRIK**—*continued.*

A complete Herring Seine of Hemp Twine, tanned in birch bark, with 2 four-armed anchors, 2 keg floats, 2 "skimblers," herring glass, herring leadline, &c. Length, 56·5 meters; depth, 9·5 m.

Herring Gill Net of Linen for the Summer Herring Fishing, white tanned or galvanised, complete; 15·7 meters long, 7 meters deep.

Herring Gill Net of Linen, for the Summer Herring Fishing, complete; 17 meters long, 7 meters deep: not tanned.

Herring Gill Net of Linen, for the Summer Herring Fishing, tanned in catechouc, complete; 15·7 meters long, 7 metres deep.

Herring Gill Net of Cotton, tanned in catechouc; complete; 15·7 meters long, 6·3 meters deep.

Herring Gill Net of Cotton, complete; 16·3 meters long, 7 meters deep.

Herring Gill Net of Cotton, not tanned; complete; 16·6 meters long, 7 meters deep.

Herring Gill Net of Hemp, tanned in birch bark; complete; 16·3 meters long, 7 meters deep.

Herring Gill Net of Hemp, not tanned; complete; 17 meters long, 7 meters deep.

Herring Gill Net of Hemp for the Winter Herring Fishing, tanned in birch bark; complete; 38 meters long, 200 meshes deep.

Herring Gill Net for the Winter Herring Fishing, not tanned; complete; 18 meters long, 100 meshes deep.

Mackerel Net of Cotton, No. 45/9, tanned in birch bark; complete; 38 meters long, 100 meshes deep.

Tramail Net in French Style, tanned in birch bark; complete; 17 meters long, 2 meters deep.

Tramail Net in French Style, not tanned; complete; 17 meters long, 2 meters deep.

Cod Gill Net of Hemp, with Glass Floats, not tanned; complete; 30 meters long, 40 meshes deep.

Herring Drift Net of Cotton, No. 45/9, in Scottish Style, tanned in catechoue; complete; 28·25 meters long, 300 meshes deep.

**ALCK-YTTER**, Kristiania.

Ice Fishing Sledge, with all Gear and Implements for Fishing

**Anderson, Abbott, & Anderson,**

**Celebrated for their OILSKINS in all the Fishing Districts of Canada, Newfoundland, Sweden, Norway, Holland, France, and the whole of the British Isles.**

**FALCK-YTTER.**—*continued*,
and for Propelling with Sticks; Snow Shoes for crossing the Ice as well as Mountains.

**FEDDERSEN & NISSEN,** Hammerfest, *Awarded*—Wien. 1873, Annerkennungs Diplom; Berlin, 1880, Silver Medal.
Implements for Shark, Dolphin, Walrus, and Seal-Fishing:—
Windlass and Lines (200 fathoms), with Iron Sinker, Hook and Snood of Chain, for Catching the Arctic Shark (*Scymnus borealis*).
Dolphin Harpoon, with a part of Handle and Line (for *Dolphinapterus leucas*).
Walrus Harpoons and Lances, with a part of Handle and Line, different forms.
Ice Anchor for the Boat.
Knife and Hook with Handle.
Arctic Shark (*Scymnus borealis*) Harpoon, with movable Wings, Lance, Hooks, and pair of Bellows to make the killed shark float.
Gaff, Bait Knife, Lever Knife, and Club.
Model of Boat, used in the Arctic Sea for above-mentioned fisheries, with Models of all Implements.

**FINEIDE, L. JOHANNESEN,** Hemnaes, Fisher at the Lofoten and Finmarken Fisheries.
Cod Gill Net, with newly invented Glass Floats and with Pieces of Chain for Sinkers. Exhibitor's invention.

**IRGENS, IØRGEN,** Bergen, Inventor of Patent Hooks.
Hooks and Iigs, with artificial Glass Bait.

**JOHANNESENS ENKE, I. CHR.,** Kristiania, Manufacturer.
Gear for Sea Fishing and Sport.

**KRISTIANIA SEILDUGSFABRIK,** Kristiania, Manufactory of Twine, Nets, and Seines. *Awarded*—London, 1862, Medal; Stockholm, 1866, Silver Medal; Boulogne-sur-Mer, 1866, Silver Medal; Paris, 1867, Silver Medal; Copenhagen, 1872, Silver Medal; Vienna, 1873, Verdienst-Medaille; Philadelphia, 1876, Medal; Paris, 1878, Silver Medal; Berlin, 1880, Silver Medal.
Seines and Nets.

GENTLEMEN'S
VENTILATED WATERPROOFS
*In Tweed, Cashmere, Gossamer, and other Materials.*
ANDERSON, ABBOTT, AND ANDERSON,
**37, Queen Victoria St., London, E.C.**

**LYSEKNAPPEN, MIKKEL T.**, Alverstrømmen, Fisherman and Seine Maker. *Awarded*—Fisheries Exhibition Berlin, 1880, Silver Medal.

Herring Seine, 10 meters long.

Herring Drift Net and Herring Gill Net, and Models of both kinds.

Samples of Seines and Nets.

**PETERSEN, KARL JOHAN**, Kristiania.

Implements for Sea Fishing.

**SCHJØTT, H. E.**, Bergen, Manufacturer and Ropemaker, Exporter. *Awarded*—Paris, 1878, Bronze Medal; Berlin, 1880, Silver Medal; Edinburgh, 1882, Silver Medal.

Herring Seine of Hemp, 120 fathoms long, 72 feet deep.

Model of Herring Purse Seine, improved, patented.

**SELSKABET FOR DE NORSKE FISKERIERS FREMME**, Bergen (Norwegian Fisheries Improvement Association).

A. Longlines with snoods and hooks, used in the Halibut fisheries.

1. Finmarken Halibut line with double twined and tanned snoods, and Norwegian bent hooks No. 3/0; the snoods are easily untied whenever required.

28a. Nordland or Lafoten Halibut line, with double twined and tanned snoods, and Norwegian bent hooks No. 2/0; the snoods are easy to untie whenever required.

Nordland or Lafoten Halibut line, with ordinary snoods and the hooks No. 1/0; the snoods are easy to untie whenever required.

13. Sóndmóre Halibut line with braided cotton, snoods and hooks, No. 1/0.

KVEITELINE FRA CARTEREN.

5. Sartoren Halibut line, with snoods and hooks No. 3; line and snoods tanned; as used before the year 1870.

6. Tartaren Halibut line, tanned with snoods and hooks No. 4; as used now. Kveiteline fra Carteren.

B. Long-lines with moods and hooks, used in the Cod fisheries.

21. Finmarken Cod-line with snoods and hooks, No. 7 Kirby bent, mounted in the new style, snoods with ordinary hooks

The Best and Cheapest. First Established 1825.

NEAVE'S FOOD FOR INFANTS AND INVALIDS.

IN ONE-POUND ONE SHILLING CANISTERS.

SOLD EVERYWHERE. WHOLESALE OF THE MANUFACTURERS,

. R. NEAVE & Co., Fordingbridge, England.

**SELSKABET FOR DE NORSKE FISKERIERS FREMME**—*continued.*

and with Kirby bent hooks, mounted in the old style; with end-buoy and middle-buoy constructed of glass-floats, and anchor-stones, also loose.

37. Lafoten Cod night-line, with snoods and Norwegian hooks No. 8, as used before the year 1850. Model of the hooks-holder.

38. Tofaten Cod Day-line, with snoods and "Norwegian" hooks No. 7, as used before the year 1850. Model of the hooks-holder.

39. Tafoten Cod Night-line, with snoods and hooks, No. 8 Kirby bent, as used in the years 1850–1860. Model of the hooks-holder.

Tafoten Cod Day-line, with snoods and hooks, No. 7 Kirby bent, as used in the years 1850–1860. Model of the hooks-holder.

Tafoten Cod Night-line, with snoods and English hooks No. 7, as now used. Model of the hooks-holder.

Tafoten Cod Day-line, with snoods and English hooks No. 8, as now used. Model of the tub for the line.

48. Tafoten Cod-line, Turhelme for Finmarken fishes, for Finmarken fishgrounds; also used as Ling and Halibut line in deep sea fisheries, with snoods and Norwegian bent hooks No. 4, as used before the year 1880. Model of the hooks-holder.

Tafoten Cod-line for Finmarken fishgrounds, also used as Ling and Halibut line in deep sea fisheries, with snoods and plain hooks No. 5, as used now. Model of the hooks-holder.

Fosen Cod-line with ordinary snoods and hooks No. 7.

Sóndmóre Cod-line, with cotton snoods and hooks No. 7, used in the shore and bank fishery.

Sóndmóre Cod-line, with cotton snoods and hooks No. 7, used in the deep sea fishery.

Lister Cod-line, with snoods and hooks No. 9, used in the shore fishery.

Lister Cod-line, with snoods and hooks No. 6, used in the deep sea fishery. Line holder of hoop-nets.

C. Long Lines, with snoods and hooks, used in different Fisheries.

ANDERSON, ABBOTT, & ANDERSON'S
GUARANTEED
DRIVING WATERPROOFS
FOR
COACHMEN AND FOOTMEN.

**ELSKABET FOR DE NORSKE FISKERIERS FREMME**—*continued.*

5. Lafoten Haddock and Plaice Long Line, with snoods and Norwegian bent hooks, No. 11, as used before the year 1850. Model of hooks-holder. Smaafischeline pra Lafoten, 6. Lafoten Haddock and Plaice Long Line, tanned, with snoods untanned, and hooks No. 10. as used now. Models of hooks-holder. Smaafischeline pra Lafoten. Flyseline pra Condmore.

15. Sóndmore Haddock Long Line, with snoods and hooks No. 9.

Sóndmóre Plaice Long Line braided, with braided snoods, and hooks No. 10. Flynoreline pra Cóndmóre.

D. Handlines and gear used in Shore and Deep Sea Fisheries.

29. Finmarken handline with gear, rope horse, iron sinker ($3\frac{1}{4}$ pounds) snoods, hooks No. 3, used at the Finmarken Shore and Deep Sea Fisheries (hooks and snoods are untied when required).

Dybsager for Finmarks pikes.

Finmarken Coalfish Gear, with lead and spoon bait, linen snood mounted to brass wire, hook and spoon bait No. 4. Also loose snood and spoon bait used when the fish goes lower in the water.

30. Lafoten Handline with gear, iron spreader and iron sinker, ($2\frac{1}{2}$ pounds) brass swivels, braided cotton snoods, English hooks No. 8. Also loose snoods of braided linen, and Norwegian bent hooks No. 4, used in the Cusk Fishery, also in the Norwegian Haddock (Hebastes Norwegicus) in 200 fathoms deep water.

Lafoten Handline with gear, rope spreader and iron sinker ($3\frac{1}{4}$ pounds), braided linen snoods, hooks No. 3, used at Lafoten, Finmarken, &c., with different sizes of hooks according to the fish. Model of hooks-holder.

Sóndmóre Handline with gear, lead and braided snood, mounted with tin baits, hooks No. 3, used in the different Bank Fa in Coal Fish, Cod Fishing, &c.

Sartorien Handline with gear, tanned line, iron sinker, four-twined snood, hook No. 8, bait hid in a crab-shell, old style, used in the Cook Wrasse Fishery.

Lister Fishing Gear, with brass horse and swivel, lead and snood, special kind of hook mounted with brass wire (to

*ANDERSON, ABBOTT, & ANDERSON'S*

**PORTABLE INDIA-RUBBER BOATS**

**For Fishing, Shooting, Exploring, and Pleasure Purposes.**

**37 QUEEN VICTORIA ST., LONDON, E.C. Works: LIMEHOUSE, E.**

**SELSKABET FOR DE NORSKE FISKERIERS FREMME**—*continued.*

protect it against the teeth of the fish). Used in the Shore Deep Sea Coal Fish and Cod Fishery.

Lister Fishing Gear, with double brass horse and swivel, lead and snood, hooks No. 4, mounted with brass wire. Used in the Shore and Deep Sea Coal Fish and Cod Fishery.

D. Implements connected with Line Fishing.

Halibut Gaff from Finmarken.
Halibut Gaff from Sartoren.
Codfish Gaff from Finmarken.
Long-line Roller from Finmarken.
Hand-line Roller from Sartoren, used in shore-fisheries.
Hand-line Roller from Sartoren, used in deep-sea fisheries.
Bait Needle from Finmarken, used in the halibut-fishery. (The bait is put on the hook by running the needle and snood through the bait, until the hook is reached.)

E. Nets and Seines.

Sóndmóre Cod-Gill Net, with wooden floats.
Sóndmóre Cod Gill Net, with glass floats and wooden floats.
Model of improved Purse Seine, intended for herring-fishing.

**TIMMS REBERBANE,** Kristiania, Ropemakers, Exporters.
Whaling and other Lines.

**WALLEM, FREDRIK. M.,** Bergen.
Herring Handline and Herring Lead.
Two Herring-handlines used on the South Coast of Norway.
Herring-handline adapted from Germany.
Herring-lead, used to sound the shoal when seining the herring.
Plaice-lead, used in the shore fishery.
Halibut-lead, used in the shore fishery.

DIVISION II.

**Oyster dredges, crab, lobster, prawn, &c., pots, and other appliances for catching fish of this description.**

**LYSEKNAPPEN, MIKKEL T.,** Fisherman and Seine-maker, Alverstrømmen.
Eel Pot.
Crab Pot.

**ANDERSON, ABBOTT, AND ANDERSON,**
**Contractors to the English Government for OILSKIN CLOTHING, as worn for Submarine, Mining, and Torpedo Works; also for their Patent Finish OILSKIN KIT BAG, as introduced by them, and adopted for the British Army.**

**ILSKABET FOR DE NORSKE FISKERIERS FREMME,** Bergen (Norwegian Fisheries Improvement Association).
Collection of Nets and Pots.

DIVISION III.

**Fishing craft of all nations; models and representations of the same.**

(i.) Steam Fishing Vessels and Steam Carriers.

**KERS MEKANISKE VÆRKSTED,** Manufactory and Steamship Yard, Kristiania.
Model of a Steam Whaler.
Model of an Ice-Breaker Steamship.

**NDERSEN, JOAK,** Aalesund.
Model of a Steam Ship with Ice Boxes, for transport of fresh fish.

**ASSEN, TELLEF,** Shipbuilder, Arendal, Shipyard at Colbjörnsvig.
Model of a Steam Trawler, and Drawings for constructing ship and rigging.

**YLANDS VÆRKSTED,** Kristiania, Manufactory and Steam-Ship Yard.
Model of a Steam Whaler.
Model of a Steamship Ice-Breaker.

**ULCANS VÆRKSTED,** Kristiania, Foundry and Ship Yard. *Awarded*—Kristiania, 1877, Diploma; Copenhagen, 1872, Medal; Drammen, 1873, Medal.
Open Steam Launch of oak, with steel gun, harpoons, &c., for shooting Whales. 8·16 meters long, 2·12 meters broad, and drawing 0·94 of water. These boats are attached to whalers and seal-ships, and also used as tenders.

NDERSON, ABBOTT, & ANDERSON,
SOLE MANUFACTURERS OF THE CELEBRATED
LEVE ANTIPLUVIUM WATERPROOF GARMENTS,
SUITED FOR ALL CLIMATES
r Gent's Fishing Waterproof Coats and Leggings, being the lightest fabric manufactured in the World.

## Division IV.

(ii.) Fishing Vessels and Boats other than Steam Vessels.

**ALLERS, CARSTEN,** Bergen.
Boat from Oselven (near Bergen), with rigging and outfit. This type of boat is common on the western coast of Norway for shore fishing, and is well known for being handy; also for sport.

**ARCHER, COLIN,** Laurvik, Boatbuilder, Smack-builder, and Constructor of Ships. *Awarded* — Berlin, 1880; Ehrenvolle Anerkennung; London, 1882, Silver Medal.
Model of a Fishing-Boat.

**BERG, NILS,** Aarnaes, Aafjorden, Boatbuilder.
Boat from Aafjord. This type of boat is well known for speed as a rowing boat.

**CHRISTENSEN, A.,** Husby, Helgeland. *Awarded*—Bergen, 1865, Mention Honorable; Tromsö, 1870, Diploma.
Model of Cod Gill-net Fishing Boat, as used at the Lofoten Fisheries.

**DAHL, A. C.,** Ringholmen, Manager of the Ringholmen Lighthouse. *Awarded*—Berlin, 1880, Silver Medal.
Three Models of Boat with Rigging and Sails.
Model of a Sail-thwart for small boats, to avoid upsetting of the boat when sailing and struck by a gale. (Exhibitor's invention.)

**FINEIDE, L. JOHANNESEN,** Hemnas.
Model of Fishing-Boat for the Lofoten and Finmarken Cod Fisheries. (Exhibitor's invention.)

**FÜRST, A. D.,** Arendal, Boatbuilder and Exporter of Boats to Sweden, Denmark, Hamburg and England. *Awarded*—Copenhagen, 1872, Diploma; Drammen, 1873, Diploma.
Model of Shore Fishing-Boat with Outfit.

**HANDELSFORENINGEN,** Trondhjem, The Commercial Association at Trondhjem.
Model of the Nordland Fishing-Boat.
Model of Herring Drift-net Boat, with Nets and Outfit.
Model of the Aafjord Boat for Cod Fishing.
Models of River Boats.

**ANDERSON, ABBOTT, & ANDERSON,**
MANUFACTURERS OF EVERY DESCRIPTION OF
**INDIA-RUBBER**
For Mechanical, Scientific, and Domestic purposes; also Manufacturers of Leather and Canvas Hose, Leather, India-Rubber, and their Patent Cerofilum Belting, Sheet Rubber, Tubing, &c.

, **OLUF**, Bergen.
s of Boats.

**IG, HARALD**, Arendal.
of Fishing Vessel, with Full Rigging and Sails.

, **TELLEF**, Arendal, Shipbuilding-yard at Colb-

of Well-Smack for Cod Fishing, and Drawing for ucting the Vessel and Rigging.

**APPEN, MIKKEL, T.**, Alverströmmen, Fisherman e Maker.
of a Herring Seine-Boat, with Seine and Outfit.
of a Herring Drift-net Boat.

**L. A.**, Mo, Ranen, Boatbuilder and Exporter. *Awarded.* ö, 1870, Diploma.
Nordland Boat, of the Ranen type, for four oars, 5 long, 1·25 meter broad.

, **PETER**, Kristiania.
of Boats.

**D, S.**, Stavanger.
ı of Models of 13 different Norwegian Fishing Vessels Boats:—
of Vessel, from Ryfylke (40 Tons).
of Decked Boat, from Hardanger (25 Tons).
of Mackerel Boat, from Lister.
of Pilot Boat, from Hvalöerne.
of Fishing-Boat, from Lister.
of Fishing-Boat, from Ryfylke.
of Seine Boat, with Seine.
of Six-Oars Boat, from Ryfylke.
of Six-Oars Boat, from Hardanger.
of Four-Oars Fishing-Boat with Floating Fish-well, Tysnes.
of Four-Oars Fishing-Boat with Well, from Ryfylke.
of Large Nordland Boat.
f Four-Oars Fishing-Boat with Well, from Hardanger.

**DERSON, ABBOTT, AND ANDERSON,**
**tors to the English Government for IN CLOTHING, as worn for Sub-Mining, and Torpedo Works; also for tent Finish OILSKIN KIT BAG, as ed by them, and adopted for the British Army.**

**SELSKABET FOR DE NORSKE FISKERIERS FREMME,** Bergen (Norwegian Fisheries Improvement Association).

Collection of Norwegian Fisheries Models, representing all types of Norwegian Fishing-Boats and some Fishing-Vessels.

1. Model of an Arctic Sea fishing-boat, with harpoons, lances, lines, axes, knives, &c., and also cooking apparatus, &c., for the crew, used in the walrus-fishery and other Arctic Sea fishery, ons-tenth of full size.
2. Model of a Fishing-boat of the Ranen type, used in the Finmarken shore and bank-fisheries, constructed of Mr. T. Forgensen at Bodö, one-tenth of full-size.
3. Model of a Lofoten fishing-boat, used in the Lofoten Cod-fishery with long line. Average full size, 12 metres long and 2·7 metres broad.
4. Model of a Lofoten fishing-boat, used in the Lofoten Cod-fishery, with gilt nets. Average full size, 12·5 metres long, 2·9 metres broad.
5. Model of a Lofoten fishing-boat of the Helgeland type. Average full size, 12 metres long and 2·7 metres broad.
6. Model of a Nordland fishing-boat of the Aafjorden type, used in Lofoten fishery, one-tenth of the full size.
7. Model of a Nordland transport vessel (Tægt), used in the trade with dried fish, shipped to the city of Bergen, about 350 miles off. The type itself is many hundred years old, but has been altered by degrees; this improvement is from last century. Average size, 22 metres long, 8·2 metres broad, 3·5 metres deep, tonnage, 80 tons. The square sail has two mourning pieces in the upper corners in regard of the death of the poet and minister Poler Pass, much esteemed and loved of the population of Nordland. He died more than 100 years ago.
8. Model of a Nordland transport vessel (Tægt), used in the trade with dried fish, shipped to Bergen. Newer style. (See explanation of No. 7.)
9. Model of a Lofoten lodging-vessel, used of the boat-crews at the Nordland fisheries, one twentieth of full size.

10–11. Models of a "Sandmore" Cod gill-net fishing-boat, used in the bank-fishery. Average full size, 12·5 metres long, 1·6 metres broad. The special form of the square

The Best and Cheapest. First Established 1825.
NEAVE'S FOOD FOR INFANTS AND INVALIDS.
IN ONE-POUND ONE SHILLING CANISTERS.
SOLD EVERYWHERE. WHOLESALE OF THE MANUFACTURERS
J. R. NEAVE & Co., Fordingbridge, England.

**SELSKABET FOR DE NORSKE FISKERIERS FREMME**—*continued.*

sail makes it easy for the boat to keep only 2½ points from the wind.

12. Model of a bank fishing-vessel, used at deep-sea cod and ling-fisheries off "Sandmore" coast, one-twentieth of full size.
13. Model of a fishing-boat from Nordfjord, used in the shore-fishery. Average full size, 9 metres long and 2·4 metres broad,
14. Model of a Herring gill-net fishing-boat from Sändfjord, used at the shore-fishery. Aveaage full size, 9·4 metres long, 1·1 metres broad.
15. Model of a transport boat from Sulen at Sognefjord. Average full size, 10 metres long and 1·3 metres broad.
16. Model of ordinary fishing-boat from Sulen at Sognefjord. Average full size, 8·7 metres long, 1·3 metres broad.
17. Model of herring seine fishing-boat from Osteró. Average full size, 9·2 metres long and 1·2 metres broad.
18. Model of herring gill-net fishing-boat from Osteró. Average full size, 8·8 metres and 1·3 metres broad.
19. Model of Six-oar boat from Haus by Bergen. Average full size, 7 metres long and 1·5 metres broad.
20. Model of Four-oar boat from Strandebarm. Average full size, 6·5 metres long and 1·5 metres broad.
21. Model of Six-oar boat from Strandebarm. Average full size, 6·3 metres long and 1·7 metres broad. The ordinary transport boat on the West coast of Norway.
22. Model of the West coast Jagt or the ordinary cured fish-carrier from the large fisheries. Average full size, 57 feet keel, 66 feet long over all on deck, 18 feet broad; tonnage, 44 to 55 tons.
23. Model of Herring Seine boat from Hardanger. Average full size, 16·7 metres long and 3·1 metres broad.
24. Model of Herring gill-net boat from Hardanger. Average full size, 7·8 metres long, 2·7 metres broad.
25. Model of Herring gill-net boat from Lister. Average full size, 10 metres long, 3·1 metres broad. This type is considered to be the very best one for the purpose.

26–30. Models of Four and Six-oar boats from the West and South coasts of Norway.

31. Model of the Hvalöer. Fishing and Pilot-boat.

**ANDERSON, ABBOTT, & ANDERSON,**

MANUFACTURERS OF EVERY DESCRIPTION OF

**INDIA-RUBBER**

For Mechanical, Scientific, and Domestic purposes; also Manufacturers of Leather and Canvas Hose, Leather, India-Rubber, and their Patent Cerofilum Belting, Sheet Rubber, Tubing, &c.

DIVISION V.

**Ropes and canvas suitable to fishing vessels.**

**NYDALENS COMPAGNIE**, Kristiania, Manufactory. *Awarded*—Bergen, 1865; Stockholm, 1866; Boulogne-sur-Mer, 1866; Paris, 1867; Trømsö, 1870; Göteburg, 1871; Copenhagen, 1872, medal; Wien, 1873; Fortschrittsmedaille, Lysekil, 1876; and Philadelphia, 1876, Medal; Paris, 1878, Gold Medal; Berlin, 1880, Medal.
Cotton Canvas.

**SCHJØTT, H. E.**, Bergen, Manufacturer and Ropemaker, Exporter.
Samples of Ropes.

**STAVANGER REBERBANE**, Stavanger, Ropery. *Awarded*—Stockholm, 1866, Silver Medal; Drammen, 1873, Mention Honorable; Stavanger, 1882, Silver Medal.
Collection of Ropes and Lines.

**TIMMS REBERBANE**, Kristiania, Ropemakers, Exporters.
Samples of Ropes.

**TØNSBERG REBERBANE**, by **C. T. ISAACHSEN**, Tønsberg, Ropery.
Six Coils of Ropes.
Samples of Lines.

DIVISION VI.

**Steam and hand capstans, compasses, barometers, telescopes, lights. lamps, fog horns, systems of signalling at night for fishing fleets and vessels, electric lights, luminous paint, and other equipment of fishing vessels, charts for fishermen.**

**GODAGER, HANS**, Trondhjem, Manufacturer. *Awarded*—Paris, 1881, Medal.
Compasses for Vessels and Boats.
Requisites for Compasses.

ANDERSON, ABBOTT, & ANDERSON'S
FOR DRIVING, RIDING, SHOOTING, FISHING, WATERPROOFS YACHTING, BICYCLING, AND GENERAL WEAR.
37, Queen Victoria Street, London, E.C.
WORKS: LIMEHOUSE, E.

**IANSEN, O. C.,** Skudesneshavn, Manufacturer of Fog Horns. *Awarded*—Edinburgh, 1882, Diploma.
Fog Horn, with handle to work the Bellows. This Fog Horn is in use in the Norwegian Navy, and by the Danish Surveyor of Lighthouses.

**OHANNESEN, J. CAPT.,** p. t. **HOBOKEN,** New York, U.S. *Awarded*—Berlin, 1880, Silver Medal.
Model of a patented Floating Anchor, for vessels adrift. Exhibitor's invention.

**UND, P. B.,** Reisen.
Sample of Tar.

DIVISION VIII.

**Fishing tackle and netting in different stages of prepa-on, and machinery used for working up the raw material.**

**HRISTIANSEN & CO.,** Laurvik, Proprietors of Laurviks Glass Work.
Samples of Glass Floats for Fishing-Nets and Lines.

**AGERHEIMS MEK. NOT OG GARNFABRIK,** Bergen, Manufacturers of Seines and Nets in complete order. Established 1873. Exporters to Sweden, Denmark, Russia, &c.
Sample of Herring Seine of Cotton.
Sample of Herring Seine of Hemp Twine.
Sample of Sprat Seine of Hemp Twine.

**ACOBSEN, HANS,** Aalesund, Manufacturer.
Machine-made Snoods and Lines.

**RISTIANIA SEILDUGSFABRIK,** Kristiania, Manufactory.
Samples of Twine.
Samples of Nets and Seines.

**YSEKNAPPEN, MIKKEL, J.,** Alverstrømmen, Fisherman and Seine Maker.
Samples of Seines.
Hand-Line and Line-Roller.

**ÆSS, JOHAN, REBSLAGER,** Trondhjem, Ropemaker. The Manufactory was established 1702, and has been continued since 1789, by Exhibitor's family. *Awarded* — Paris, 1878, Silver Medal.
Collection of Samples of Ropes, Hand-Lines, Long Lines, and Nets.

**YDALENS COMPAGNI,** Kristiania, Manufactory.
Samples of Seines and Nets of Cotton.

**TAVANGER REBERBANE,** Stavanger, Ropery.
Samples of Fishing-Lines.

## Class I.—Section II.

## FRESHWATER FISHING.

### Division XIII.

**Salmon nets and fixed appliances for catching salmonidæ in all their varieties.**

**FAGERHEIMS MEK. NOT-OG GARNFABRIK**, Bergen. Manufactory of Seines and Nets in complete order; established 1873. Exporters to Sweden, Denmark, Russia, &c.
Salmon Fly Net, not tanned.

**HANDELSFORENINGEN**, Trondhjem, The Commercial Association at Trondhjem.
Salmon Gill Net.
Trout Gill Net.
Model of a Salmon Fly Net.

**LYSEKNAPPEN, MIKKEL T.**, Alverströmmen, Fisherman and Seine Maker.
Model of a Salmon Fly Net.

**SELSKABET FOR DE NORSKE FISKERIERS FREMME**, Bergen (Norwegian Fisheries Improvement Association).
Nets used in the Mjosen Lake.

### Division XIV.

**Salmon rods, reels, lines, artificial flies and baits, gaffs, spears, creels, &c.**

**JOHANNESENS ENKE, I. CHR.**, Kristiania, Manufacturer.
Gear for Salmon Fishing.

**HANDELSFORENINGEN**, Trondhjem, The Commercial Association at Trondhjem.
Salmon Light and Spear (Lyster).

### Division XV.

**Trout rods, reels, landing nets, lines, artificial flies, baits, baskets, bags, &c.**

**JOHANNESENS ENKE, I. CHR.**, Kristiania, Manufacturer.
Gear for Trout Fishing.

### Division XVII.

**Traps, nets, bucks, wheels, and all kinds of apparatus for catching eels, lampreys, &c.**

**LYSEKNAPPEN, MIKKEL T.**, Alverstrømmen, Fisherman and Seine Maker.
Eel Pot.

**SELSKABET FOR DE NORSKE FISKERIERS FREMME**, Bergen (Norwegian Fisheries Improvement Association).
Eel Pot, and ordinary Pots for freshwater fishing.

## CLASS II.

## ECONOMIC CONDITION OF FISHERMEN.

### DIVISION XXI.

### Apparel and personal equipment.

**FJELD, KRISTOFFER K.,** Sartoren.
Fishermen's Dress.
Men's and Women's Dress.
Fishermen's Boots.
Fishermen's Oil Suit.
Fishermen's Prepared Goat-Skin Suit.
Fishermen's Hand Basket, for daily use, for travelling, for visits, and when going to church. Eight different sorts.

**FLEKKEFJORDS GARVERI,** Flekkefjord, Tannery and Export Establishment. *Awarded*—Paris, 1867; Drammen, 1873; Philadelphia, 1876; Berlin, 1877; Paris, 1878.
Samples of leather.
Leather for Fishermen's Boots.

**GOTAAS, W. C.,** Bodø.
Patented South-Wester.

**HANDELSFORENINGEN,** Trondhjem, The Commercial Association at Trondhjem.
Fishermen's Suit.

**HANSEN HELLY, T.,** Moss, Manufacturer, Export. *Awarded*—Paris, 1878, Mention Honorable.
Fishermen's Oil Suit.

**OLSEN, JENS CHR.,** Moss Manufacturer.
Grease for Fishermen's Boots.

**SCHRØDER, B. H.,** Skien, Manufacturer, Export (by Oulie & Sørensen, Agents, Kristiania). *Awarded*—Edinburgh, 1882, Diploma of Honour.
Grease for Fishermen's Boots.

**SUND, N.,** Haugesund.
Fishermen's Oil-skin Suit.
Fishermen's Patented South-Wester.

## Division XXII.

### Food and medicine chests.

**FINNE, Dr. EDV.**, Drøbak.
Cooking Apparatus that needs no Fire.
Apparatus for Family Use.
Apparatus for Vessels.
Apparatus for Fishing-Boats.
Apparatus to carry in a Trunk.

The Apparatus will prepare food as well in an open fishing-boat as in a close travelling trunk, and needs no special attention.

## Division XXIII.

### Models and plans of dwellings.

**HANDELSFORENINGEN**, Trondhjem, (The Commercial Association at Trondhjem).
Model of a Fisherman's Hut at the Lofoten Cod Fishery.

**SELSKABET FOR DE NORSKE FISKERIERS FREMME**, Bergen (Norwegian Fisheries Improvement Association).
Collection of models of fishermen's houses.

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### Notes to Class III.

The export of fish-products from Norway will average 170,000 tons net per year. 1·5 per cent. being fresh or iced fish; the remainder is salted, dried, pickled, spiced or smoked, fish oil, roe and guano. The value of the exported fish produce will average 2·4 million pounds sterling, 5 per cent. representing iced or fresh fish.

If all the fish now cured for export were shipped fresh, Norway could furnish the European and transatlantic markets with more than 600,000 tons of fresh cod and other large fish, besides herring, 2,500 tons of iced salmon, mackerel and halibut, now exported.

The distance from the fish-stations, where the catch is made, to the usual markets and the lack of suitable communication between European markets and the Norwegian fishing grounds, as well as the season of the year at which the fishing is carried on, make it more convenient for the fishermen to sell the catch fresh to the fish-curers, who then cure the fish in many different ways, suitable to the consumers abroad, who for hundreds of years have been dealing with Norwegian cured fish. Only during the last 20 years a trade in fresh fish of the catch in summer time has sprung up; but this trade is not as yet more than 1·5 per cent. of the export.

he following table shows the Export of the principal fish products from way last year:—

| | |
|---|---|
| Dried Fish or Stokfish of Cod, Coalfish, Haddock, Ling, &c. | 15·2 million kilogrammes |
| Dry Salted Codfish (also Haddock, Ling, &c.), or "Klipfisk" | 40·1 ,, ,, |
| Pickled Herrings | 723·2 thousands of hectoliters |
| Roe of Codfish | 66·5 ,, ,, |
| Fish Oil (the principal part of which is Cod Liver Oil) | 100·6 ,, ,, |

For the years 1878–1882 on an average.

| | |
|---|---|
| Dried Fish or Stokfish | 18·0 millions of kilogrammes |
| Dried Salted Codfish, &c., "Klipfisk" | 44·1 ,, ,, |
| Pickled Herring | 770·4 thousands of hectoliters |
| Roe of Codfish | 64·9 ,, ,, |
| Cod Liver Oil (and Fish Oil) | 135·5 ,, ,, |

The Export of Fish Products, 1881, was in respect to the different kinds as ows:—

| | Weight Net in kilogrammes. | Value in Kroner £1 sterling.=18 kr. |
|---|---|---|
| Salmon, Fresh and Iced | 379,670 | 569,500 |
| Mackerel, Fresh and Iced | 1,829,210 | 365,800 |
| Other kinds of Fish, Fresh and Iced | 146,890 | 52,900 |
| Stokfish— | | |
| Dried and Split Fish | 1,770,810 | 717,300 |
| Coalfish | 3,377,520 | 675,500 |
| Dried and Round Fish | 13,597,960 | 4,707,900 |
| Other kinds of Stokfish | 129,910 | 34,100 |
| Dry Salted Codfish, &c. (Klipfisk) | 41,918,720 | 16,012,000 |
| Salted Herrings— | | |
| Spring or Winter Herring | 4,956,524 | 835,700 |
| "Large" Herring | 360,254 | 75,400 |
| New or Mixed Herring | 139,750 | 16,300 |
| Fat or Summer Herring | 71,591,388 | 13,485,800 |
| Sprat | 6,728,554 | 469,400 |
| Iceland Herring | 9,740,790 | 1,359,200 |
| Other kinds of Herring | 276,318 | 38,500 |
| Salted Fish, not referred to above— | | |
| In Barrels and Kegs | 1,410,830 | 184,100 |
| In Vessels | 14,032,660 | 1,390,100 |
| Anchovies | 1,308,216 | 734,500 |
| Smoked Salmon | 2,980 | 6,000 |
| Smoked Herring | 354,109 | 113,300 |
| Lobster | 500,990 | 400,800 |
| Oysters | 6,800 | 6,800 |
| Shell Fish | 40,000 | 1,600 |
| Fish Meal | 1,108 | 400 |
| Skin of Ice Bears | 176 | 600 |
| ,, Seals | 229,031 | 301,200 |
| ,, Walrus | 37,300 | 11,200 |
| ,, Dolphins | 18,840 | 22,600 |

| | | |
|---|---|---|
| Tusk of Walrus | 665 | 2,100 |
| Whalebone | 17,120 | 154,100 |
| Roe of Codfish | 6,330,000 | 1,091,900 |
| Sounds of Fish | 21,918 | 28,500 |
| Fish Guano | 8,344,550 | 1,335,100 |
| Fat of Seals and Whales | 602,172 | 252,100 |
| Spermaceti Oil | 43,560 | 24,200 |
| Medicinal Cod Liver Oil— | | |
| Steam Refined | 882,291 | 681,700 |
| Natural | 1,164,267 | 704,200 |
| Bright Cod Liver Oil | 1,839,354 | 905,100 |
| Pale Brown ditto | 2,898,717 | 1,208,400 |
| Brown ditto | 4,004,952 | 1,582,400 |
| Other kinds of Fish Oil | 827,607 | 356,300 |
| Footing of Fishing Oil | 165,168 | 12,400 |

The total value of Exports from Norway was

| | 1880. | 1881. |
|---|---|---|
| Fish Products | 38·13 million kr. | 50·16 million kr. |
| Products of Sealing, Whaling, and Hunting | 1·41 ,, | 1·35 ,, |
| The whole Exports, all kinds | 108·74 ,, | 120·93 ,, |

Export of Fish Products from Norway to Great Britain and Ireland, 1880 and 1881 :—

| | Value in Kroner £1 sterling = 18·2 Kr. | |
|---|---|---|
| | 1880 | 1881 |
| Salmon, Fresh or Iced | 344,300 | 421,200 |
| Mackerel and other fish, Fresh or Iced | 440,100 | 386,300 |
| Stockfish | 75,700 | 175,600 |
| Dry Salted Fish ("Klipfisk") | 1,159,400 | 1,980,900 |

## CLASS III.

## COMMERCIAL AND ECONOMIC.

### DIVISION XXV.

### Preparation, preservation, and utilisation of fish, and all forms of life included in Class V.

(*a*) For edible purposes—

i. Models of fish-curing establishments. Methods of, and models and other representations of any appliances for drying, curing, salting, smoking, tinning, cooking, &c.

**GRUNG, J.**, Kristianssund, Manufacturer. Established 1861.
Filter Apparatus for Cod Liver Oil.
Barrels of Tinned Iron Plates for Cod Liver Oil (improved).

Exhibitor is the first manufacturer who introduced the improved tinned barrels for Cod Liver Oil into Norway.

**HELGESEN, H. A.**, Aalesund, Manufacturer.
Steam Apparatus for manufacturing Cod Liver Oil for Medical Purposes.
Barrels for Cod Liver Oil.
Improved Tap for Cod Liver Oil Barrels.

**JONASEN, G.**, Stavanger, Exporter of Iced Fish.
Model of an Icehouse.

**MØLLER, PETER**, Lofoten and Kristiania. *Awarded.*—London, 1862, the only Medal; Bergen, 1865, Gold Medal; Stockholm, 1866, First Prize; Boulogne, 1866, Silver Medal; Paris, 1867, Silver Medal; Naples, 1871, the only Medal; Christiania, 1871, the only Medal; Copenhagen, 1872, the only First Prize; Moscow, 1872, the only First Prize; Vienna, 1873, the only Medal for Progress, and the Medal "for Merit"; Drammen, 1873, the First Prize; Philadelphia, 1876, the First Prize; Paris, 1878, the only Gold Medal; Berlin, 1880, Gold Medal.
Apparatus for preparing Cod Liver Oil.

**SANNEM, J. A.**, Bergen, Manufacturers: Speciality, Tinned Barrels for Cod Liver Oil. Export. Established 1873. *Awarded*—Berlin, 1880, Honourable Mention.
Tinned Barrels for Cod Liver Oil, with wooden cover.
Photographs explaining the improvement.

**SELSKABET FOR DE NORSKE FISKERIERS FREMME**, Bergen (Norwegian Fisheries Improvement Association).
Model of curing yard and drying places.

## Division XXVI.

ii. Fish dried, smoked, cured, salted, tinned, or otherwise prepared for food.

**AMELN, BROTHERS,** Bergen, Fish Curers and Exporters.
Iceland Herring.
Drift Net Spring Herring.
Gill Net Spring Herring.
"K" Summer Herring, largest size (Kjøbmandssild).
"M" Summer Herring, next size (Middelsild).
"C" Summer Herring, third size (Christianiasild).
"B" Sprat.

**ANDERSEN, JOAK,** Aalesund, Manufacturer, Exporter.
Smoked Salmon in Oil, tinned and hermetically sealed.
Smoked Herring in Oil, tinned and hermetically sealed.
Smoked Halibut, tinned and hermetically sealed.
Smoked Fish, tinned and hermetically sealed.
Lobster and Salmon, tinned and hermetically sealed.
Fish Cakes in Sauce, tinned and hermetically sealed.
Fish Balls in Sauce, tinned and hermetically sealed.
Dry Salted Codfish, in wooden boxes.

**ASTRUP, M. H.,** Kristianssund, owner of Fishing Stations, Fish Curer and Exporter. *Awarded*—Paris, 1878, Mention Honorable; Berlin, 1880, Bronze Medal.
Dry Salted Codfish, for Transatlantic export.
Dry Salted Codfish (Toston), for European markets.
Dry Salted Ling.
Dry Salted Cusk.
Dry Salted Coalfish.
Twenty Kg.'s Ball Dry Codfish (Stockfish).
Pickled Herring, in glasses.

**BERG, MRS. FREDRIKKE,** Kristiania. Manufactory and Export.
Anchovies, in half and quarter kegs.
Anchovies, in glasses.

**BERGEN'S HERMETISKE FABRIK,** Bergen, Manufactory of Preserved Provisions. Established 1883.
Anchovies, in one, half, and quarter tins.
Herring and Sprat, *à la Sardine*, in half and quarter tins.
Eels in Oil, in half tins.
Eels in Oil, Boned and Skinned, in half tins.
Fish *à la Rouget*, in whole and half tins.
Mackerel, Fish Pudding, Fish Cakes.
Boneless Fresh Fish, in half tins.
Smoked Herring in Oil, in whole tins.

**IOLDT, G. J.,** Kristiania, Manufacturer, Exporter.
*d*—London, 1862, Mention Honorable; Viborg, 1875,
Medal; Paris, 1878, Mention Honorable; Berlin, 1880,
n Honorable.
hovies, in kegs and in glasses.

**EN, TOB. U.,** Trondhjem.
Salted Codfish for Havana.

**LDSEN D.S., D.,** Bergen.
Samples of all Sorts of Dried Fish, viz.:—
kfish of Cod, Round.
kfish of Cod, Split.
kfish of Ling, Split.
kfish of Cusk, Round.
kfish of Cusk, Split.
kfish of Haddock, Round.
kfish of Coalfish, Split.

**IANIA PRESERVING CO.,** Kristiania, Manufactory
ammen and Finmarken, Export. Established 1872.
*d*—Drammen, 1873, Bronze Medal; Philadelphia, 1876,
Medals; Paris, 1878, Bronze Medal; Berlin, 1880, Silver
; Malmö, 1881, Diploma of Honour.
hovies.
ied Fish.

**LINSSEN, JOHS.,** Stavanger, Manufacturer, Ex-

hovies.
ied Fish.

**RØGERI,** Kristianssund, Fish Curing Establishment,
*Awarded*—Edinburgh, 1882, Silver Medal.
ied Fish.
ked Herrings.

**& WESNES,** Stavanger, Manufactory.
hovies, in kegs and in tins.
hovies, Skimmed and Boned.

**SEN, CORNELIUS,** Aalesund, Manufacturer.
Tinned Goods.
Cakes, Fish Balls, Fish Pudding, Cooked Dry Salted
dfish in Oil, Smoked Salmon in Oil, &c.

**SEN, H. A.,** Aalesund, Manufacturer.
ied Salmon.
ied Lobster.

**H, F.,** Fredrikshald, Manufacturer, Exporter. *Awarded*—
agen 1872; Viborg, 1875, Silver Medal; Paris, 1878,
Medal; Berlin, 1880, Mention Honorable.
hovies, in kegs.

**HJUL, S. H.**, Kristiania, Manufacturer.
Anchovies.

**HOLM, OVE**, Bergen, Fish Curer.
Fat Pickled Herrings, in kegs.

**ISDAHL & CO.**, Bergen.
Cured Fish.

**JAKUTTIS, F. E.**, Aalesund, Manufacturer.
Tinned Lobster (with the shell on) in Madeira Sauce.
Tinned Salmon in Oil.
Tinned Smoked Salmon in Oil.

**JOHNSEN, CHRISTIAN**, Kristianssund, Fish Curer (established 1854) and Exporter to Spain, Portugal, United States, &c. *Awarded*—Paris, 1867, Bronze Medal; Stockholm, 1868, Bronze Medal; Philadelphia, 1876, Silver Medal and Three Diplomas of Honour; Paris, 1878, Two Silver Medals and Three Diplomas of Honour; Berlin, 1880, Silver Medal and Three Diplomas of Honour; Edinburgh, 1882, Two Silver Medals.
Dry Salted Codfish.
Dry Salted Ling, in wooden boxes, Boneless.
Dry Salted Haddock, Cusk, and Coal Fish.

**KNUDTZON, NICOLAY H.**, Kristianssund, Fish Curer and Exporter.
Dry Salted Codfish.
Dry Salted Codfish, in wooden boxes.
Dry Salted Codfish, in tin with wooden cover.

**KOCH, J. C.**, Bodø, Fish Curer and Exporter.
Dry Salted Codfish.

**KONOW, WOLLERT**, Bergen, Exporter.
Dry and Salted Fish.

**LANGE, JOHAN**, Bergen, Fish Curer and Exporter. *Awarded*—Berlin, 1880, Bronze Medal; Edinburgh, 1882, Diploma and Special Prize.
Dry Salted Codfish.
Dry Codfish, Stockfish.
Pickled Herrings.

**LEHMKUHL, J. E.**, Bergen, Ship Owner, Fish Curer, and Exporter. Established 1847. *Awarded*—Berlin, 1880, Gold Medal.
Dry Salted Codfish from Lofoten and Finmarken.
Pickled Herring, J. S. and V. S. Brands.
Fat Herrings, KKK, KK, K, M, and C Brands.
Sprats.

**EHMKUHL, J. E.**—*continued.*
Stockfish:—
Dried Codfish, Round.
Dried Codfish, Split.
Dried Cusk, Round and Split.
Dried Haddock, Round.
Dried Ling, Split.
Dried Coalfish, Split.

**JND, GEORG,** Kristiania, Manufacturer and Exporter. *Awarded* — Philadelphia, 1876, Medal; Berlin, 1880, Bronze Medal and Diploma.
Anchovies, in kegs and in glasses.
Trout prepared as Rakörret.

**EYER, GERDT,** Bergen, Fish Curer and Exporter. *Awarded* —Boulogne-sur-Mer, 1866, Bronze Medal for Steam Refined Medicinal Cod Liver Oil; Paris, 1878, Gold Medal for Cod Liver Oil for Tanning; Paris, 1878, Bronze Medal for Prepared Fish; Berlin, 1880, Silver Medal for Medicinal Cod Liver Oil and Dry Salted Fish.
Dry Salted Fish.
Dried Fish.
Dry Salted Codfish, in tin and wooden cover.

**DE, THEODOR,** Trondhjem, Exporter. *Awarded*—Berlin, 880, Diploma of Honour.
Samples of Dry Salted and Dried Fish.
A Keg of Fat Herrings.

**OSS PRESERVING CO.,** Moss. Manufactory established n 1882.
Tinned Fish.
Salmon in Oil.
Mackerel in Oil.
Fishcakes in Curry.
Fishcakes in Wine Sauce.
Anchovies in Oil, in tins.
Anchovies in Brine, in kegs.

**OWINCKEL & SON, JOH. LUDW.,** Bergen, Fish Curers nd Exporters. Established 1805. *Awarded*—Bergen, 1865, Mention Honorable; Arcachon, 1866, Silver Medal; Paris, 1878, Silver Medal; Berlin, 1880, Silver Medal.
Dried Codfish.
A. Round Stockfish of Cod from Lofoten.
B. Round Stockfish of Cod from Finmarken.
C. Split Stockfish of Cod.
D. Split Stockfish of Ling.
E. Split Stockfish of Cusk.
F. Round Stockfish.
Cusk.

**MOWINCKEL & SON, JOH. LUDW**—*continued.*
G. Split Stockfish of Coalfish.
H. Dried Sea Wolf or Wolf-fish.
I. Cuts of Dried Fish Necks and Tails.
K. Dry Salted Codfish.

**MYHRE, FRITZ,** Trondhjem, Fish Curer and Exporter. *Awarded*—Berlin, 1880, Mention Honorable; Edinburgh, 1882, Silver Medal.
Pickled Herring KKK, KK, K and M, in kegs.
Pickled Sprat, in kegs.
Dry Salted Fish.
Dried Fish.

**MYHRVOLD, MRS. CHRISTIANE C.,** Kristiania, Manufactory, Export. Established 1863. *Awarded*—Copenhagen, 1872; London, 1873; Berlin, 1880; Greifswald, 1881; Edinburgh, 1882.
Anchovies, in kegs.

**NIELSEN, GEORG,** Kristiania.
Anchovies, in kegs, with the trade mark C. M. Hansen.

**NILSEN, HELEN,** Bergen, Fish Curer and Exporter. *Awarded*—Edinburgh, 1882, Diploma for Special Preparation of Herrings.
Pickled Fat Herrings, in $\frac{1}{2}$, $\frac{1}{4}$, $\frac{1}{8}$, $\frac{1}{16}$, and $\frac{1}{32}$ barrels.
Pickled Fat Herrings, in glasses.
Dry Salted Codfish.

**NORDLANDS PRESERVING CO.,** Bodø, Manufactory. *Awarded*—Berlin, 1880, Diploma; Edinburgh, 1882, Diploma.
Fish Pudding, in tins.
Fish Balls, with Brown Sauce, in tins.
Fish Balls, with White Sauce, in tins.
Smoked Herring.
Smoked *Sebastes Norwegicus.*

**NORDROCK, WM.,** Kristiania, Manufacturer.
Anchovies.

**THE NORWEGIAN PRESERVING CO.,** Mandal, Manufactory. Established 1866. *Awarded*—Paris, 1867, Bronze Medal; Copenhagen, 1872, Mention Honorable; Brussels, 1874, Bronze Medal; Philadelphia, 1876, Bronze Medal; Paris, 1878, Silver Medal.
Fish Pudding.
Fish Roulettes.
Fish Cakes.
Fish Balls in different kinds of Sauces.

**OLSEN, CARL O.**, Stavanger, Manufacturer and Exporter. *Awarded*—Berlin, 1880, Bronze Medal.
Anchovies, in one, half, and quarter kegs.
Anchovies, in whole and half tins.
"Appetit" Herring (Boned and Skinned Anchovies) in whole and half tins.
Spiced Herring, in tins.

**PARELIUS & LOSSIUS**, Kristianssund, Fish Curers and Exporters to European, Transatlantic, and Australian Ports. *Awarded*—Berlin, 1880, Silver Medal.
Dry Salted Codfish, in tins with wooden cover.
Boneless Codfish, in tins with wooden cover.
Pickled Fat Herrings, in kegs.

**PUNTERVOLD, OLE**, Ekersund, Manufacturer. *Awarded*—Paris, 1878, Mention Honorable; Berlin, 1880, Mention Honorable.
Anchovies, in kegs.

**PUNTERVOLD, T. H.**, Ekersund.
Fresh Fish, in kegs, Preserved.

**RØNNEBERG, T.**, Stavanger, (by Bergesen and Blaauw), Manufactory. Established 1882.

Collection of Preserved Fish :—
Fish Pudding, Fish Gratin, Salmon, Mackerel, Halibut, Fish Balls, Fish Cakes, and Lobster.

**SCHREINER & NIELSEN**, Stavanger, Manufactory.
Anchovies and "Appetit" Herring.

**SIVERTSEN, S. M.**, Mosjøen, Manufacturer.
Smoked Fat Herring in Oil, in quarter, half, and whole tins.

**SMITH, GINA**, Kristiania, Manufactory (established about the year 1800), Export to Hamburg, Copenhagen, and Amsterdam. *Awarded*—London, 1862; Bergen, 1865; Paris, 1867; Stockholm, 1866; Boulogne-sur-Mer, 1866; Lysekil, 1868; Drammen, 1873, Medal; Naples, 1871, Silver Medal; Vienna, 1873, Diploma of Honour; London, 1874, Medal; Philadelphia, 1876, Medal; Berlin, 1880, Silver Medal.
Anchovies.

**STAVANGER PRESERVING CO.**, Stavanger, Manufactory, Export to England, France, Netherlands, Germany, United States, and East Indies. *Awarded*—Paris, 1875; Brussels, 1876; London, 1878, Silver Medal; Philadelphia, 1876, Medal; Paris, 1878, Silver Medal; Berlin, 1880, Gold Medal; Edinburgh, 1882, Silver Medal; Stavanger, 1882, Silver Medal.
Collection of Preserved Fish, Smoked Fish, Pickled Herring, and Anchovies, in tin.

**STOCKFLETH, MRS. GINA,** Bergen, Manufactory. *Awarded*—Paris, 1878; Berlin, 1880.
Anchovies, in kegs and in tins.

**TELLEFSEN, MRS. RINA,** Kristiania, Manufactory and Export. *Awarded*—Berlin, 1873; London, 1873; Paris, 1875; Philadelphia, 1876; Paris, 1878; Berlin, 1880; Edinburgh, 1882.
Anchovies, in whole, half, and quarter kegs.

**THESEN JOHAN, & CO.,** Bergen, Fish Curers and Exporters. *Awarded*—Berlin, 1880, Silver Medal.
Dried Codfish, Round.
Dried Codfish, Split.
Dried Haddock, Round.
Dried Ling, Split.
Dried Cusk, Split.
Dried Cusk, Round.
Dried Coalfish.
Dry Salted Codfish from Lofoten, from Finmarken, third quality.
Cuts of Dried Fish Necks.
Cuts of Dried Fish "Tails."

**THORSEN, H.,** Sunde, Søndhordland, Manufacturer and Exporter. Established 1862. *Awarded*—Berlin, 1880, Diploma.
Anchovies, in tins.
Anchovies in Oil, in tins.
Sprats *à la Sardine*, in tins.

**TROMSØ COLLECTIVE EXHIBITION,** Tromsø (Andr. Aagaard, O. Albrethsen, P. Hansen & Co., M. W. Holmboe & Son, Mack & Co., Anton Næss).
Collection of Samples of Dried Fish.

**VALVATNE, H.,** Sunde, Søndhordland, Manufacturer. *Awarded*—Berlin, 1880, Bronze Medal.
Anchovies, in tins.

**WAHL & CO., EDW.,** Trondhjem, Fish Curers and Exporters. *Awarded*—Berlin, 1880, Bronze Medal.
Pickled Herrings and Dried Fish.

## Division XXVII.

iii. All products prepared from fish, such as oils, roes, isinglass, &c.

**ANDERSEN, JOAK,** Aalesund, Manufacturer.
Samples of Medicinal Cod Liver Oil.

**ASTRUP, M. H.,** Kristianssund.
Samples of Medicinal Cod Liver Oil.
Roe of Codfish.

**RTHEN, TOB. U.**, Trondhjem, Manufacturer and Exporter.
[anufactories at Halten, Lofoten, and in Finmarken.
Samples of Medicinal Cod Liver Oil.
Steam Refined Medicinal Cod Liver Oil.
Roe of Codfish.

**ANDTZÆG, ANTHON M.**, Applevær, Manufacturer and
xporter.
Steam Manufactured Medicinal Cod Liver Oil in Samples.

**EKKE, LARS**, Aalesund, Manufacturer and Exporter.
Steam Refined and Natural Medicinal Cod Liver Oil.

**HL, N. P.**, Molde, Manufacturer and Exporter. *Awarded*—
erlin, 1880, Gold Medal; Edinburgh, 1882, Diploma.
Medicinal Cod Liver Oil.

**RVELL, A. FRED.**, Molde, Manufacturer and Exporter.
Medicinal Cod Liver Oil.

**NRIKSEN, T. H.**, Tromsø.
Medicinal Cod Liver Oil.

**EL, P. C.**, Aalesund, Exporter. Manufactories at Rundø,
lø and Sjeide. *Awarded*—Berlin, 1880, Diploma of Honour.
Steam Refined Medicinal Cod Liver Oil. Established 1859.

**AHL & CO.**, Bergen. Manufactories at Lofoten and in
inmarken. Exporters to United States, France, England.
*warded*—Paris, 1878, Silver Medal, Bronze Medal and Mention
onorable; Berlin, 1880, Bronze Medal.
Medicinal Cod Liver Oil.

**RVELL, OTTO S.**, Aalesund. Manufactories at Søndmøre
nd Lofoten, Export. *Awarded*—Boulogne-sur-Mer, Gold Medal
o the present Manager of Exhibitor's Manufactories).
Steam Refined Medicinal Cod Liver Oil.

**INSEN, CHRISTIAN**, Kristianssund, Fish Curer and Ex-
orter.
Medicinal Cod Liver Oil.
Roe of Codfish.
Isinglass.
Salted Fish Tongues and Salted Sounds.

**UDTZON, NICOLAY, H.**, Kristianssund, Manufacturer
nd Exporter.
Steam Refined Medicinal Cod Liver Oil.

**NOW, WOLLERT**, Bergen. Manufactory at Lokøen
ergen. Established 1883.
Fish Oil.
Isinglass.
Fish Glue.

**NGE, JOHAN**, Bergen.
Medicinal Cod Liver Oil.

**LEHMKUHL, J. E.**, Bergen.
Roe of Codfish, 1st and 2nd qualities.
Steam Refined Medicinal Cod Liver Oil.

**LOTHE, JOHAN**, Bergen, Manufacturer and Apothecary.
Medicinal Cod Liver Oil.

**MEYER, GERDT**, Bergen.
Medicinal Cod Liver Oil.

**MØLLER, PETER**, Kristiania, Manufacturer, Inventor and Exporter. *Awarded*—London, 1862, the only Medal; Bergen, 1865, Gold Medal; Stockholm, 1866, First Prize; Boulogne, 1866, Silver Medal; Paris, 1867, Silver Medal; Naples, 1871, the only Medal; Christiania, 1871, the only Medal; Copenhagen, 1876, the only First Prize; Moscow, 1872, the only First Prize; Vienna, 1873, the only Medal for Progress and the Medal "for Merit;" Drammen, 1873, the First Prize; Philadelphia, 1872, the First Prize; Paris, 1878, the only Gold Medal; Berlin, 1880, Gold Medal. Inventor of the method for manufacturing steam refined cod liver oil.
Steam Refined Cod Liver Oil.

**MOWINCKEL & SON, JOH. LUDW.**, Bergen, Exporters.
Medicinal Cod Liver Oil.
Steam Refined Medicinal Cod Liver Oil.

**OLSEN & CO.**, Wardø.
Samples of Medicinal Cod Liver Oil.

**THESEN & CO., JOHAN**, Bergen.
Steam Refined Medicinal Cod Liver Oil.
Natural Medicinal Cod Liver Oil.

**TROMSØ COLLECTIVE EXHIBITION**, Tromsø (Andr. Aagaard, O. Albrethson, P. Hansen & Co., M. W. Holmboe & Son, Mack & Co., Anton Næss).
Medicinal Cod Liver Oil.

## Division XXVIII.

### iv. Antiseptics suitable for preserving fish for food.

**HENRIKSEN, J. H.**, Tromsø.
Ice.

**NÆSØEN'S ICE-EXPORTING COMPANY**, per Ths. Joh. Heftye & Son, Kristiania, Export. *Awarded*—Brussels, 1876, Mention Honorable; Paris, 1878, Silver Medal.
Ice.

**NORD, M. E.**, Kristiania, Manufacturer of Refrigerators.
Refrigerator and Freezer.

**SVARTISEN'S COMPANY**, Bergen. Export Company, Address: Svaneapotheket, Bergen. Owners of a part of the glacier Findøren, north of Trondhjem and 70 miles south of Bodö. The owners' portion can furnish 25 millions of tons block-ice of same quality as exhibited samples, that will melt ten per cent. slower than common ice. For sale or renting for five or ten years.

Samples of Ice from the Glacier Findören.

## Division XXIX.

(b) For other than edible purposes—

i. Oils, manures, and other products prepared from fish.

**ASTRUP, M. H.**, Kristianssund.
Cod Liver Oil.

**BORTHEN, TOB. U.**, Trondhjem.
Bright Cod Liver Oil.
Brown Cod Liver Oil.

**BREKKE, BERNHRD**, Trondhjem, Manufactory and Export.
Fish Guano.

**BREKKE, LARS**, Aalesund.
Samples of Cod Liver Oil.

**HOLMBOE, ANTON**, Vardø.
Fish Guano.

**HVALFANGERSELSKABET, "FINMARKEN"** (Whale Fishing Co.), Tønsberg, Fishing Company and Exporters.
Three Samples of Whale Oil.
Sample of Fish Guano, prepared from the flesh and bone of Whales.

**HVALFANGERSELSKABET, "MADVIK"** (Whale Fishing Co.), Kristiania, per Consul-General Chr. Christophersen, Kristiania, Fishing Company and Exporters, Madvik Iarfjorden in Finmarken.
Refined Whale Oil in bottles.

**ISDAHL & CO.**, Bergen, Manufacturers and Exporters.
Fish Oil for Tanning.
Fish Oil for Technical Purposes.

**JOHNSEN, CHRISTIAN**, Kristianssund, Manufacturer and Exporter.
Fish Oil for Tanning and other Trade Purposes.
"Footing" of Fish Oil.
Fish Guano.

**KONOW, WOLLERT**, Bergen, Manufactory at Lokøen Bergen. Established 1883.
Fish Oil, Fish Guano and Manure.
Fish Glue.

**LANGE, JOHAN,** Bergen.
Samples of Fish Oil.

**LEHMKUHL, J. E.,** Bergen.
Fish Oil and Fish Roe.

**MEYER, GERDT,** Bergen.
Fish Oil.

**MOWINCKEL & SON, JOH. LUDW.,** Bergen.
Bright Cod Liver Oil.
Pale Brown Cod Liver Oil.
Brown Cod Liver Oil.

**DET NORSKE FISKEGUANOSELSKAB,** Lerosen Svolvær, Manufacturers of Fish Guano, Exporters.
Fish Guano.

**OLSEN & CO.,** Vardø.
Samples of Fish Oil.

**THESEN & CO., JOHAN,** Bergen.
Bright, Pale Brown, and Brown Cod Liver Oil, and Fish Oil.

**TROMSØ COLLECTIVE EXHIBITION,** Tromsø (Andr. Aagaard, O. Albrethsen, P. Hansen & Co., M. W. Holmboe & Son, Mack & Co., Anton Næss).
Samples of Fish Oil.

## Division XXXII.

iv. Preparation and application of sponges, corals, pearls, shells, and all parts and products of aquatic animals, &c., to purposes useful and ornamental, with specimens.

**BERNHOFT, ALBERT,** Bodø, Fish Curer and Proprietor.
Ash of Seaweeds from Lofoten Islands.

**BORTHEN, TOB. U.,** Trondhjem.
Pure Eider Down.

**BRANDT, C.,** Bergen, Manufacturer and Exporter. *Awarded*—London, 1862; Paris, 1867; Copenhagen, 1872; Kristiania, 1873; Vienna, 1873; Drammen, 1873; Philadelphia, 1876; Paris, 1878, Gold Medal; Cleve, 1881, Gold Medal; Berlin, 1880, Silver Medal.
Prepared Skins of Ice Bears, Seals, Otters, &c.
Prepared Skins of Aquatic Birds.
Carpets and Covers prepared from Skins of the Eider Duck and other Aquatic Birds.

**FEDDERSEN & NISSEN,** Hammerfest, Fish Curers and Exporters.
Tusks of Walrus.
Head of Walrus.

**ROMSØ COLLECTIVE EXHIBITION,** Tromsø (Andr. Aagaard, O. Albrethsen, P. Hansen & Co., M. W. Holmboe & Son, Mack & Co., Anton Næss).
Eider Down.
Head of Walrus.

DIVISION XXXIII.

## Transport and sale of fish.

(a) Appliances for carrying fish and for preserving fish during transport or erwise, and models of the same.

**NDERSEN, EMIL,** Kristiania (Lakksgaden 55), Manufacurer and Exporter. *Awarded*—Paris, 1878, Mention Honorable; Berlin, 1880, Mention Honorable.
Kegs for Anchovies.

**NSEN, OLUF,** Bergen, Manufacturer.
Model of Floating Fish Well.

**HNSEN, CHRISTIAN,** Kristianssund, Manufacturer and Exporter.
Samples of Barrels (made by machinery), iron hooped, wood hooped, of pine and of birch.
Staves, Prepared and Rough Hewn.
Boxes for Cured Fish.
Oak Barrels for Cod Liver Oil.

**SEKNAPPEN, MIKKEL I.,** Alverstrømmen.
Model of a Floating Fish Well.
Fish Bucket.

**ÆR & CO., AND. H.,** Fredriksstad, Manufacturers.
Barrels for Pickled Fish.

**EYER, G. A.,** Aastvedt, Bergen, Manufacturer and Inventor. *Awarded*—Boulogne-sur-mer, 1866, Bronze Medal; Berlin, 1880, Bronze Medal.
Barrels for Pickled Herrings.
Kegs for Pickled Herrings.

**DE, THEODOR,** Trondhjem.
Improved Barrel for Anchovies (Exhibitor's Invention).

**NDERSON, ABBOTT, & ANDERSON'S**
**FISHING WATERPROOFS**
**CANNOT BE EXCELLED.**
7, QUEEN VICTORIA ST., LONDON, E.C.

**SELSKABET FOR DE NORSKE FISKERIERS FREMME**, Bergen (Norwegian Fisheries Improvement Association).
Floating Fish Wells as used on the west coast of Norway.

**TVETEN, JOHAN A.**, Tveten, Porsgrund, Manufacturer.
Birch Staves for Barrels.

## Division XXXV.

**Models or drawing of fish hatching, breeding and rearing establishments, including oyster and other shellfish grounds; and all apparatus and implements connected with the same, and for transporting fish and fish ova. Food for fry.**

**BYGDØ KONGSGAARD** (the Royal Farm, Bygdo), by Holst, Superintendent and Chamberlain, Kristiania.
Three models of (old) Hatching Apparatus.

**FJELDS FISKERISELSKAB**, Bergen. *Awarded* — Edinburgh, 1882, Silver Medal.
Hatching Apparatus for Salmon and Trout.
Transport Apparatus for Fish Ova.

**LANDMARK, A.**, Inspector of Fisheries, Kristiania, Inspector of the Fresh Water Fisheries of Norway.
Apparatus for transporting Fresh Impregnated Fish Ova.

**WALLEM, FREDRIK M.**, Bergen.
Apparatus for transporting Ova of Salmon and Trout.
Apparatus with Refrigerator for transporting Fry of Salmon and Trout.

## Division XXXVI.

**Representations illustrative of the development and progressive growth of fish.**

**FJELDS FISKERISELSKAB**, Bergen.
Development of Salmon, Trout and Char, represented by specimens of the parent fish, ova and fry, in spirits.

ANDERSON, ABBOTT, UND ANDERSON,
37, Queen Victoria Street, London, England,
Fabrikanten aller Gattungen von
GUMMI-WAAREN
für mechanische, wissenschaftliche und häusliche Zwecke; ferner Fabrikanten von Leder und Cannevas Wasserschläuchen, und Gummi- Leder- und Patent Cerofilum Treibriemen, Kautschukplatten, Röhre, u. s. w.

**ARS, PROFESSOR G. O.**, Kristiania. (Exhibits in the Collection of Selskabet for de Norske Fiskeriers, Fremme). *Awarded*—Paris, 1867, Silver Medal from the Societé d'Acclimation at Paris.

Development of the Cod (*gadus morrhua*), explained by a series fifty-six coloured drawings on seven plates, made by the Exhitor during his visits to the Lofoten Islands in the years 1865–69.

PLATE I.

Fig. 1. Part of an ovarian sac not fully matured, showing the disposition of the ova in leaf-like clusters converging to the interior cavity of ovisac.

Fig. 2. Two immature ovicells.

Fig. 3. An egg from the ovarian sac, figured No. 1.

Fig. 4. Four eggs from a ripe ovisac, showing the blood-vessels ramifying in the surrounding capsules.

Fig. 5. A ripe egg protruding from its capsule.

Fig. 6. A ripe egg pressed out from the genital duct of a spawny cod. The germinal layer, at first uniformly spread over the yolk, is about to accumulate on the lower pale of the egg.

Fig. 6a. Part of the germinal layer of the same egg as seen under a very high magnifying power.

Fig. 7. The same egg after having floated some time in the water, without being impregnated, figured in two different aspects. The germinal disc has been formed at the lower pole, but no segmentation has taken place in the same. The small oil-globules of the germinal layer are partly run together in larger globular masses, of which a row surrounds the germinal disc. The micropyle is seen as a small spot in the outer egg-membrane somewhat to the right in the lower part of the egg.

Fig. 8. A small portion of a ripe miltsac, showing the finely ramifying blood-vessels.

Fig. 9. Spermatozoa as seen through a very powerful microscope.

Fig. 10. The micropyle-apparatus with the surrounding area, seen from the outer face, highly magnified.

Fig. 11. Segment of a ripe egg with the micropyle-apparatus seen in profile, demonstrating the impregnation.

Figs. 12–24. Segmentation of the germinal disc. (In Figs. 12–14 and 23 and 24 the egg is figured in two different aspects, so as to exhibit the germinal disc both from the outer face and in profile; in Figs. 15–22 only in the former position.)

**SARS, PROFESSOR G. O.**—*continued.*

Fig. 12. A slight vertical depression has appeared i middle of the germinal disc, which is surrounded, as following stages, by a clear zone.

Fig. 13. The depression has taken the form of a d furrow on instriction dividing the disc vertically.

Fig. 14. The primary segmentation in two halves i pleted.

Fig. 15. The horizontal furrow has appeared in th primary divisions.

Fig. 16. The disc is divided into four segments.

Fig. 17. A vertical furrow has appeared in every one four segments.

Fig. 18. The disc is divided into eight distinct segmen at the same time has assumed a somewhat oblong form

Fig. 19. The disc is divided into sixteen segments forming a single layer.

Fig. 20. The segmentation has continued, the disc bein composed of several layers of cellular divisions and sh a more regular form.

Fig. 21. The divisions are still more numerous and d pressed together, assuming a polygonal shape.

Fig. 22. The disc is composed of numerous small segme cells.

Fig. 23. The segments are so numerous and small, as t the disc an almost granular structure. The upper still plane.

Fig. 24. The segmentation is completed, and the di contracted itself and assumed a biscuit-like form, the face being now strongly convex, while a thin ma layer of small clear cells has been formed in the segm zone of the disc fifth day after impregnation.

PLATE. II.

Formation of the blastoderm and development of the em 1865. (All the eggs are figured in two different aspects so exhibit the embryo both from the dorsal face and in profile

Fig. 25. Egg on the sixth day after impregnation. The convexity of the germinal disc has assumed a some irregular shape, being on one side, where the embry develop itself, more prominent. The cells of the di about to separate into two distinct layers, the one (epi forming a thinner girdle around the central part.

Fig. 26. The embryonal swelling is distinctly seen o one side. The upper surface of the germinal disc is

**RS, PROFESSOR G. O.**—*continued.*

in the middle so as to give the whole the form of a small cup occupying the lower pole of the egg (the incipient blastoderm), the peripheral girdle being now somewhat denser as the central part.

Fig. 27. The blastoderm has been formed, and begins to grow up on the sides of the egg, spreading over the yolk, while the embryonal space advances downwards as a broad triangular lobe, showing at the apex the first appearance of the embryo (the brain and part of the spinal marrow).

Fig. 28. The blastoderm has reached the ægratorial zone of the egg, and the embryonic lobe has advanced beyond the lower pole, showing more distinctly the brain of the embryo with the ocular processes.

Fig. 29. The blastoderm has advanced considerably beyond the ægratorial zone of the egg, and the embryonal lobe is much narrowed and prolonged, showing an additional part of the spinal marrow.

Fig. 30. The blastoderm occupies almost the whole interior sphere (yolk) of the egg, only leaving a small circular space at the upper pole bounded by the thickened rim. The embryo shows the first appearance of the pectoral fins as a pair of small lobes at some distance back from the brain. The notochord also is in this stage faintly perceived beneath the spinal marrow.

Fig. 31. The blastoderm is fully developed, enclosing as a complete capsule the whole interior yolk-mass of the egg. The embryo is still more completely differentiated, showing the notochord, the formation of the primary muscle-plates on each side of the same, and the first trace of the eye-lens and of the ear-vesicles between them and the pectoral fins. At the point where the blastoderm has closed over the yolk a little vesicle is seen protruding from the caudal end of the embryo.

Fig. 32. The embryo is still more developed, occupying considerably more than the half circumference of the egg. The tail is formed as a slight projection turned on one side. The first trace of the heart is seen in this stage as a small round vesicle beneath the head, without, however, yet making any pulsations. The muscle-plates are distinctly seen on both sides of the notochord.

Fig. 33. The tail of the embryo is rather prolonged, advancing over the yolk, and shows the clear natatory fold. The eyes are slightly pigmented, and show their lenses more distinctly. The heart has assumed a fusiform shape and a somewhat obliquely transverse direction, showing slow pull sations. Beneath the pectoral fins a small swelling is seen representing the liver, and behind it the alimentary canal

the end of the notochord still protruding in th
Two very slight folds on the upper and lower si
caudal portion of the body are the first appearar
two hinder dorsal and the two anal fins. The e
are considerably increased and of a somewhat
form. The blood has assumed a red colour.

Fig. 42. Young of 16 mm. length caught at the surf
sea in the first days of June. The radii of the t
dorsal fins and the anal fins are distinctly seen,
sign of the foremost dorsal fin and of the abdomin
made its appearance. The caudal fin is still more
and the embryonal natatory fold is about to be
forming slight instrictions between the developi
tent fins.

Fig. 43. Young of 22 mm. length, caught at the surf
sea in the middle of June. The primitive natat
almost quite obliterated, and the persistent fins a
the foremost dorsal still being very small. The
lining of the visceral cavity is developed, conce
viscera.

PLATE IV.

Development of the young Cod, continued, 1866–1

Fig. 44. Young Cod of 35 mm. length, caught bene
fish (*Cyanea capillata*), first days of July. Ever
the primitive natatory fold has now disappeared
persistent fins are developed, the foremost dorsa
abdominals, however, being still rather small. T
at the end of the lower jaw is about to be form
pigmentary spots of the body are increased in nu
form on each side six or eight faint transverse ban

ARS, PROFESSOR G. O.—*continued.*

is about to be formed. Faint ramifications of pigment have appeared on the back of the body.

Fig. 34. The embryo is rather more developed, encircling now the whole circumference of the yolk, the tail being considerably prolonged, so as to meet or go beyond the snout; on the last the nasal pits are distinctly seen. The embryo escape not rarely from the egg in this stage. (See Plate III., Fig. 37.)

Fig. 35. Egg in the last stage of development, eighteenth day after impregnation. The embryo now move rather energetically in the interior of the egg, assuming different positions, as shown in the two figures. The eyes are fully pigmentated, and the pigmentary ramifications of the body are accumulated in several limited parts, forming two dark transverse bands over the tail and another along the upper side of the alimentary canal.

Fig. 36. Young at the moment of hatching.

PLATE III.

Development of the young after hatching, 1865–1866.

Fig. 37. Young recently hatched, answering the stage as shown in Plate II., Fig. 34. The yolk-sac is very large and globular, and the fore-part of the body still somewhat deflexed. The notochord is distinctly seen occupying the axis of the very narrow body.

Fig. 37a. The same seen from beneath.

Fig. 38. Young a little more developed, answering the stage Plate II., Figs. 35 and 36. The yolk-sac has somewhat diminished, but the mouth is still closed. The pigment of the eyes and body is more pronounced.

Fig. 39. Young eighth day after hatching. The yolk-sac is almost entirely absorbed and the mouth is formed. The alimentary canal is dilated but still simple, not convoluted. The choroidal fissure of the eyes distinct in the two preceding stages has disappeared, and the pigmentary bands of the body are coarser.

Fig. 39a. The same seen from above, showing the hoodlike expansion of the natatory fold over the fore-part of the body.

Fig. 40. Young on the fourteenth day after hatching. The yolk-sac is completely absorbed, and the alimentary canal is about to make its first winding. The lower jaw is considerably advanced beyond the upper, giving the young a rather strange physiognomy. At the end of the tail a few radiating stripes are seen as the first sign of the formation of the caudal fin.

**SARS, PROFESSOR G. O.**—*continued.*

Fig. 46. Young Cod of 60 mm. length, caught at the bottom, close to the shore, middle of August. The colour of the body is darker, and the alternating spots more pronounced and quadrangulars forming four longitudinal rows on each side. The cirrus of the lower jaw is fully developed and protracted.

Fig. 47. Young Cod of 80 mm. length, caught under similar circumstances and at the same time as the former. The dark spots are about to flow together, and along the lateral line four or five very light patches are discerned.

Fig. 48. Young Cod of 100 mm. length, caught near the shore along with smaller ones in the latter part of August. The colour is again about to change, the original dark spots now having quite flowed together, forming the ground colour of the body, while light irregularly formed spots have made their appearance disposed on each side in three longitudinal rows, the middle one occupying the lateral line.

Fig. 49. Young Cod of 166 mm. length, caught at a depth of 10 to 12 fathoms in the vicinity of the shore, natural size. The colour now is about to assume the one characteristic of the species.

PLATE V.

Development of the Young Cod, continued.

Figs. 50–52. Three specimens of somewhat different colour, caught December, 1868, at the depth of 10 to 12 fathoms in the vicinity of the shore, natural size. In the upper figure the colour is that which is most frequently met with. The middle one exhibits the peculiar red-brown hue and robust form not rarely observed in specimens which visit stony bottoms with a rich vegetation of red alga. The lower figure shows the less vivid colour and more slender form, which the young Cod often assume after having dwelt for some time on a sandy bottom of the sea.

PLATE VI.

Development of the Young Cod, continued.

Figs. 53 & 54. Two specimens of somewhat different colour and size, caught off the shore at a depth of 20 to 30 fathoms, January, 1869, the upper figure natural size, the lower one two-thirds natural size. These specimens are about one year old.

PLATE VII.

Fig. 55. Cod of 20 in. length, not yet adult, caught in March, 1869, at a depth of 30 to 40 fathoms, half natural size.

Fig. 56. Adult spawny Cod of 33 in. length, caught on the fishing banks at a depth of 80 to 100 fathoms, one-third natural size, March, 1869.

## Division XXXVII.

**Models and drawings of fish passes and fish ladders.**

**BYGDØ KONGSGAARD** (the Royal Farm, Bygdø), by Holst, the Superintendent and Chamberlain, Kristiania.

Model of the Fish Ladder in the Sarpsfos, constructed by Mr. Løvstad.

**LANDMARK, A.**, Inspector of Fisheries, Kristiania; Inspector of the Freshwater Fisheries of Norway. *Awarded*—Edinburgh, 1882, Silver Medal.

Drawings with Map and Explanation of the Salmon Ladder at Sireaaen.

## Division XL.

iii. Physico-chemical investigation into those qualities of salt and fresh water which affect aquatic animals; investigation of the bottom of the sea and of lakes, shown by samples; aquatic plants in relation to fishing, &c.; researches into the aquatic fauna (animals of the several classes preserved in alcohol or prepared, &c.); apparatus and implements used in such researches.

**MOHN, H.**, Professor, Kristiania. *Awarded*—Berlin, 1880, Gold Medal.

Chart of the Depths of the Norwegian Sea and of the Arctic Ocean.

Map showing the Distribution of Temperature in the Norwegian Sea and of the Arctic Ocean (vertical sections).

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# Class V.

# NATURAL HISTORY.

## [Aquaria.]

## Division XLII.

**Specimens living (marine and fresh water), fresh, stuffed or preserved, casts, drawings, and representations of—**

(a) Algæ to be arranged under genera and species with localities appended.

**POSLIE, M.**, Lødingen at Lofoten.

Collection of Algæ from the Arctic Ocean and the coast of Norway

| | |
|---|---|
| Florideæ. | Desmarestieæ. |
| Fucaceæ. | Myrionemieæ. |
| Dictyotaceæ. | Aglaozonieæ. |
| Phæozoosporeæ. | Sphacelarieæ. |
| Seytosiphoneæ. | Ectocarpeæ. |
| Punctarieæ. | Chlorozoosporeæ. |
| Sporochneæ. | Siphoneæ. |
| Encoelieæ. | Characieæ. |
| Chordarieæ. | Hematogeneæ. |

## Division XLV.

(*d*) Entozoa and epizoa.

**SELSKABET FOR DE NORSKE FISKERI FREMME**, Bergen (Norwegian Fisheries Improvement ciation).

Collection of Entozia and Epizoa.

## Division XLVI.

(*e*) Mollusca of all kinds and shells not included in Class III.

**SELSKABET FOR DE NORSKE FISKERI FREMME**, Bergen (Norwegian Fisheries Improvement ciation).

Various Mollusca from the West Coast of Norway.

**TROMSØ MUSÆUM**, Tromsø.

Various Objects from the Arctic Sea.

## Division XLVII.

(*f*) Starfishes, sea urchins, holothuriæ.

**SELSKABET FOR DE NORSKE FISKERI FREMME**, Bergen (Norwegian Fisheries Improvement A ciation).

Various Starfishes and Sea Urchins from the West Coa

[redacted]

**TROMSO MUSÆUM**, Tromsø.

Buccinum undatum.
Buccinum parvulum.
Buccinum Donovani.
Buccinum fragile.
Buccinum convideum.
Buccinum grænlandicum.
Buccinum finmarchianum.
Buccinum Humphreysianum.
Neptunea despecta.
Volutopsis norvegica.
Chrysodomus Turtani.
Sipho islandicus.
Sipho glaber.
Sipho tortuosus.
Sipho Sarsic.
Sipho latericeus.
Boreofusus Berniciensis.
Sipho fusiformis.
Hyas araneus.
Hyas coarctatus.
Eupagurus bernhardus.
Eupagurus pubescens.
Galathea strigosa.
Crangon boreas.
Crangon vulgaris.
Sabinea 7 carinata.
Hippolyte gaimardi.
Hippolyte polaris.
Hippolyte spinus.
Hippolyte turgida.
Hippolyte pusiola.
Pandalus annulicornis.
Euphausia inermis.
Thysanopoda norvegica.
Mysis inermis.
Mysis oculata.
Mysis mixta.
Lamprops fasciata.
Lamprops fuscata.
Leucon nasicus.
Eudorella emarginata.
Diastylis Rathkii.
Diastylis Edwardsii.
Diastylis Goodsiri.
Apseudes spinosus.
Oga Strömii.
Idothea tricuspidata.
Astacilla longicornis.
Janira maculata.
Parathemisto abyssorum.
Hyale Nilssonii.
Locarnes Vahlii.
Hippomedan Holbölli.
Eurytenes gryllus.
Orchomene minutus.
Anonyx lagena.
Anonyx gulosus.
Onisimus plautus.
Phoxus Holbölli.
Syrrhoï crenulata.
Oediceros saginatus.
Oediceros lynceus.
Monoculodes borealis.
Monoculodes langirostris.
Monoculodes latimanus.
Aceros phyllanyx.
Pleustes panoplus.
Acanthozone cuspidata.
Halirages tridentatus.
Halirages fulvocinctus.
Calliopius laviusculus.
Amphitopsis latipes.
Pardalisca cuspidata.
Gammarus locusta.
Melita dentata.
Amathilla Sabini.
Ampelisca macrocephala.
Ampelisca Eschrichtii.
Haploops tubicola.
Byblis Gaimardii.
Protomedeia fasceiata.
Amphithoë podoceroides.
Podocerus angripes.
Unciola irrorata.
Caprella septentrionalis.
Cyamus boopis.
Gammarus pulex.
Tritropis inflata.
Vertumnus serratus.
Metopa sölsbergi.

## Division LI.

(*k*) Fish of all kinds.

**FOSS, O. P.**, Vestfossen Drammen, Exhibits in the Collection of "Selskabet for de norske Fiskeriers Fremme."
Fishes from the Drammens River and its tributary lakes and streams, in spirits.

**HAALAND, ELIAS**, Bergen Museum.
A Stuffed Halibut, weighing when alive 254 pounds.
A Stuffed Eel, 7½ feet long.
A Stuffed Ling, 5¾ feet long.
Stuffed Codfish, Coalfish, Gadus, Norwegius, Sea-wolf, Cusk.

**HANDELSFORENINGEN**, Trondhjem (Commercial Association at Trondhjem).

Stuffed Fishes.

Greenland Shark.
Seal.
Lampis guttatus.
Lump Fish.
Wolf Fish.
Plaice.
Turbot.
Skate.
Pleuronectus microcephalus.
Ling.
Cod.
Coalfish.
Haddock.
Norwegian Haddock.
Gurnard.

**HETTING, M. G.**, Kristiania.
Landlocked Salmon, in spirits.

**LØKKE**, Bodø.
Fry of Sebastes Norwegicus, in spirits (taken out alive from the mother fish).

**MØLLER, PETER**, Kristiania.
Some Stuffed Saltwater Fishes.

**NEEGAARD, O. N.**, Stai, Qsterdalen (Exhibits in the Collection of "Selskabet for de norske Fiskeriers Fremme").
Collection of Fishes from the River Glommen and its tributary streams, in spirits.

**LSKABET FOR DE NORSKE FISKERIERS REMME,** Bergen (Norwegian Fisheries Improvement Association).

Gasterasteus aculeatus, Lin.
Spinacea vulgaris, Fleming.
Sebastes imperialis, Cuv.
Cottus scorpius, Fabr.
C. poriclopus.
C. bubalis, Enphr.
Phobetor ventralis Cur.
Trigla gurnardus, Lin.
Aspidophorus cataphractus, Lin.
Agonus cataphractus, Lin.
Trachinus draco, Lin.
Scomber scombrus, Lin.
Gobius microps, Kroyer.
Gobius minutus, Gmel.
G. pictus, Mahn.
G. niger, Lin.
G. Ruthensparri, Enphr.
Latrunculus Stuwitzii, Düb.
Cyclopterus lumpus, Lin.
Liparis Montagniu, Don.
Lophius piscatorius, Lin.
Lumperius lampetraformis, Wall.
Anarrhichas lupus, Lin.
Zoarces vivaparus, Lin.
Mugil septentrionalis, Günth.
2 Labrus maculatus, Nils.
2 Labrus mixtus, Lin.
Crenilabrus melops, Lin.
Ctenolabrus ruprestric, Lin.
Acantholabrus exoletus, Lin.
Macronus nepestris, Block.
Gadus morrhua, Lin.
Ditto ditto 3 years old.
Ditto ditto 2 years old.
Ditto ditto 1 year oid.
Gadus æglefinus, Lin.
Ditto ditto 2 years old.
Ditto ditto 1 year old.
Gadus merlangus, Lin.
Gadus minutus, Lin.
Gadus Esmarkii, Lin,
Gadus poutassou, Risso.
Gadus pollachius, Lin.
Gadus virens, Lin.
Ditto ditto 3 years old.
Ditto ditto 2 years old.
Ditto ditto 1 year old.

**SELSKABET FOR DE NORSKE FISKERI PREMME**—*continued.*

Merlucius vulgaris, Fleming.
Phycis furcatus, Fleming.
Lota vulgaris.
Molva vulgaris, Nils.
M. abyssorum, Nilss.
Motella cimbria, Lin.
Motella mustela, Lin.
Motella tricirrata, Nils.
Brosmius vulgaris, Cuv.
Ditto ditto young.
Ammodytes tobianus, Lin.
2 A. lanceolatus, Lin.
Hippoglossus vulgaris, Flm., young.
H. Limandoides, Bloch.
Bhombus maximus, Lin.
Zeugopterus punctatus, Bloch.
Z. megastomus, Don.
2 Pleuronectus cynoglussus, Lin.
Pleuronectus platessa, Lin.
2 P. microcephalus, Don.
2 P. limanda, Lin.
P. flesus, Lin.
Solea vulgaris, Quens.
Maurolicus borealis, Nils.
Salmo, salar, Lin.
Ditto ditto 4 years old.
Ditto ditto 3 years old.

[redacted]

**ˌSKABET FOR DE NORSKE FISKERIES REMME**—*continued.*

Alburnus lucidus.
12 Clupea harengus, Lin. Collections in respect of various localities and age.
C. sprattus, Lin.
Ditto ditto 2 years old.
Ditto ditto 1 yoar old.
Alosa communis, Liv.
2 Anguilla vulgaris, Turt.
Conger vulgaris, Yarrel.
Siphonostoma typhle, Lin.
Syngnathus acus, Lin.
Nerophis œquoreus, Lin.
N. ophidion, Lin.
2 Chimæra monstrosa.
Scyllium annulatum, Nils.
2 Acanthias vulgaris, Risso.
2 Syinax nigar, Bonap.
Raya radiata, Don.
Petromyzon marimus Lin.
Myxine glutinosa, Lin.

**ƆLIE, PETER P.**, Løsset, Stenvigen (Exhibits in the Collection of "Selskabet for de norske Fiskeriers Fremme").

Collection of Fishes from the Glommen and its tributary streams, in spirits.

**ˌOMSØ MUSÆUM**, Tromsø.

shes used for *bait* at the different Finmarken Shore Fisheries.

Haddock.
Anamdytes Tobianus.
Herring.
Salmon.
Lumpfish.
Roe of Codfish.
Capelin.
Young Coalfish.
Also Fat of Seal (Phoeæna communis).

## Division LIII.

(*m*) Aquatic and other birds hostile to fish or fishing.

**ÅNDT, C.**, Bergen.

Collection of Aquatic Birds (stuffed) as Eiderducks, Gulls, Ducks, &c.

**DYBDAHL, R.**, Trondhjem.

Collection of stuffed aquatic birds.

Mallard Duck,
Scamp Duck,
Butterbull.
Black Throated Diver.
Eider Duck.
Sheldrake.
Red Throated Diver.
Herring Gulf.
Kittewake Gulf.
Scoter Duck.
Cormorant.
Jayes or Skua.
Little Gulf.

**HANDELSFORENINGEN**, Trondhjem (Commercial Association at Trondhjem).

Stuffed Birds.

Herring Gull.
Sheldrake.
Razor Bill.
Mergulus Alle.
Kittywake Gull.

**TROMSØ MUSÆUM**, Tromsø.

Stuffed Birds.

Eider Duck.
Somateria mollissima.
Phalacrcorax carbo.
Colymbus arcticus.
Larus marinus.
Spitzberg's Eider Duck.

DIVISION LIV.

(*n*) Aquatic and amphibious mammalia (otters, seals, whales, &c.) and others detrimental to fish.

**BRANDT, C.**, Bergen.

Stuffed Animals.

Specimens of Icebear, Seal, &c.

DIVISION LV.

**Works on Ichthyology. Maps illustrating geographical distribution, migration, &c., of fishes and spawn.**

**THE NORWEGIAN NORTH-ATLANTIC EXPEDITION, 1876-1878.** Report by Professor H. Mohn, the Chief Editor (Exhibits in the Collection of "Selskabet for de norske Fiskeriers Fremme").

## CLASS VI.

### ITORY AND LITERATURE OF FISHING, FISHERY LAWS AND FISH COMMERCE.

### DIVISION LVII.

**ncient fishing implements or their reproductions, iels, pictures, books, emblems, charters and seals of ient fishermen guilds.**

**RGEN MUSÆUM**, Bergen.

Bow and Arrows used to kill the whale (*Balænoptera rostrata*), also Lances and Harpoons, two Knives used to cut the fat and flesh, etc.

n a certain part of the western coast of Norway, whales pass ıugh the narrow inlet of a fjord and fail to find their way back n. When swimming around the bay, the whale would be ırved at once, and the fishermen try to kill it by means of a le pointed iron arrow, only five or six inches long. The mode ›roceeding was to shoot from the bow an arrow with a loose point up inthe air in such a manner that it would fall down ›endicularly and strike the body of the whale. Iron points, e of old ship-bolts and rather rusty, would be preferred as the for the purpose. When struck by the iron the whale would n about for twenty-four or thirty hours, and then float up to surface of the water dead or poisoned, having a wound, a foot nore in diameter, around the place where the iron had struck; iron point itself would be found worked down to the backbone, ›me vital part.

s the shaft of the arrow was loose, of wood, and marked with owner's initials, it would get detached from the iron point and , and thus show which of the fishermen, if more than one had , had killed the whale.

fter having cut out the wounded part with a special knife, and women from all the farms around the bay, being the le hunting time on the look out would meet with their whale- 'es and cut out of the whale their special and long predeter- ›d pieces and bring them home for food.

hese implements are still in occasional use.

**ADMO, T. C.**, Kristiania, Sculptor. *Awarded* — London, 162, Bronze Medal; Stockholm, 1869, Silver Medal.

Two Models of the Viking Ship found lately at Gokstad by Sandefjord.

**OLAYSEN, N.**, Kristiania, Antiquary.

Exhibitor's Work: The Viking Ship, discovered at Gokstad in Norway, described by N. Nicolaysen, with 1 map, 10 woodcuts and 13 plates. Kristiania, 1882.

**SØREFJELD, THOMAS E.**, Sartoren.
Bow and Arrow to kill a whale.
Lances, Hooks and Harpoons used in the Basking
Fishery.

**VÆRING, O.**, Kristiania, Photographer.
Photgraphs of the Viking Ship found at Gokstad.
Photograph of the Model of same Viking Ship.

DIVISION LVIII.

**Fishery laws of different countries.**

**SELSKABET FOR DE NORSKE FISKERI**
**FREMME**, Bergen (Norwegian Fisheries Improvement
ciation).
Collection of Norway's Fishing Laws.

DIVISION LX.

**Reports, statistics and literature of fish, fishing an**
**fisheries.**

**BENNETTER, J.**, Sole Stavanger, Painter. *Awarded*—
Mention Honorable; Havre, Silver Medal; the Gold
Litteris et Artibus.

Oil Paintings.

Seining Herrings at Seidisfjord, Iceland.
Snowstorm, when Sailing for Fishing off Iceland.
Scenery of a Fishing Station at Iceland in the Evening.
A Herring Curing House.

**BERGSLIEN, NILS**, Bergen, Painter.
Life of Fishermen.

**BERNHOFT, ALBERT**, Bodø.
Fishing on the Lofoten Fishing Grounds with Cod Gill
and Lines.

**BØE, FRANTZ**, Bergen, Painter. *Awarded*—Paris,
Mention Honorable.
Aquatic Birds by the Light of the Midnight Sun at
mandøen, Lofoten.
Fishermen going out for their Nets at Lofoten.
Norwegian Salt Water Fishes.
Wild Ducks and their Young Ones.
Marine Shells and Pearls.
Fishermen at North Cape, Midnight Sun.

**BOECK, TH.**, Kristiania,
Literature of Fish and Fisheries.

**E CENTRAL BUREAU OF STATISTICS,** Govern-ıent Office, Kristiania. *Awarded*—Cordova, 1871, Silver Iedal; Paris, 1875, in the International Geographical Congress, 'irst Class Medal; Philadelphia, 1876, Medal; Berlin, 1880, ilver Medal.

Statistical Tables and Reports on the Norwegian Fisheries in 1881, and for the years 1866–1881.

**ETRICHSON, T. L. W.,** Molde, Master at the School of Iolde. *Awarded*—Paris, 1875, Mention Honorable for a Newly nvented Bathothermometer.

Statistical Maps of the Norwegian Fisheries for each year from 1866–1880, in three explantory Plates for 1866–1870, 1871–1875, and 1876–1880.

The Catch of the most important Fishes for each County.

The Export of the most important Fish Products for each Custom House Office.

The Population for Norway, of each County and Town.

The Depth of Water on the Coast of Norway.

The Export of the most important Fish Products from Norway to different Countries.

**AN, MISS MARGARETHA,** Bergen.

Oil Painting.

Fishes from Lakes and Fjords.

**ALAND, LAURITZ,** Hvidingsø, Stavanger, Painter.

Oil Painting.

Herring Fishing with Nets in Winter. (Aatefiskeri.)

**LCK, JULIUS,** Bergen, Painter.

Oil Painting.

Seining in a Norwegian Lake.

Trout Fishing in the River Holvigselven.

**LMBOE, O.,** Fredriksstad, Custom House Surveyor at Fredriksstad. *Awarded*—Berlin, 1880, Bronze Medal.

A Geographic-statistical Map of the Norwegian Fisheries showing the Export of Fish Products.

**HNSEN, HJALMAR,** Kristiania, Painter.

Oil Painting.

Spring Herring Fishery on the West Coast of Norway.

Lafoten Fishing Boat in a Gale.

**VAAS, HANS,** Bergen, Painter.

Oil Painting.

The Fishing Station Ona at Romsdalen, Norway.

**THE PRIVATE SURVEYING OFFICE,** Kristiania.
Statistical Maps of Norway.
Heliotyped Drawings of Different Ways of catching Salt Water Fish in Norway.
Maps relating to Norwegian Expeditions to the Arctic Sea.
Maps relating to the Norwegian Expedition for Exploring the North Atlantic Ocean.

**REIN, E.,** Bergen, Painter.
Oil Painting.
Norwegian Boats.

**SARS, PROFESSOR G. O.,** Kristiania.
Reports on Norwegian Fisheries.

**SCHJELDERUP, MISS LEIS,** Bergen, Artist.
Oil Painting.
Norwegian Fishes and Fishing Boat.

**SCHIERTZ, F. W.,** Bergen, Painter.
Oil Paintings taken when Exhibitor was a Member of the Norwegian Expedition for Exploring the North Atlantic and Arctic Ocean—
Fishing Station in the Northern Part of Finmarken.
The Bay of Driftwood on the Eastern Coast of Jan Mayen Island.
Seal Fishermen on Drifting Ice off the Eastern Coast of Greenland.
A Graveyard in the North-western part of Spitzbergen.

**SELSKABET FOR DE NORSKE FISKERIERS FREMME,** Bergen (Norwegian Fisheries Improvement Association).
Collection of Drawings and Pictures relating to the Norwegian expeditions to the Arctic Sea.

**SKARI, EDW.,** Kristiania, Painter.
Oil Paintings.
Seal Fishing.
Whale Fishing.

**SØVIG, THEODOR,** Bergen, Painter.
Oil Paintings.
Lofoten Yachts of the Way to Bergen with Fish Products.
The Harbour of Bergen, with Fishing Vessels and Transporting Vessels.

**HE SURVEYOR-GENERAL'S OFFICE,** Kristiania.
Chart of Soundings off the Coast of Norway.
Chart of the Coast of Norway.
Chart of some Fishing Places on the Coast of Norway.

**CKERMANN, H.,** Bergen, Painter.
Oil Paintings.
Aquatic Birds.

**LFSTEEN, NIC.,** Bergen, Painter.
Oil Painting.
Fisherboats and Fishermen at the Coast of Jæderen (Norway).
Sprat Fishing at Stavanger.

**ÆRING, O.,** Kristiania.
Photographs of Fisheries in Norway.

**ALLEM, FREDRIK M.,** Bergen.
Report on American Fisheries (1877).
Report on French Fisheries and Industry connected with them (1880).
Report on the International Fisheries Exhibition at Berlin, 1880 (1881).
Herring Fishery of Holland (1882).

**ENTZEL, GUSTAV.,** Kristiania, Painter.
Oil Painting.
Shed for Fishing Boats.

**IGDAHL, A. G.,** Bergen, Painter.
Oil Paintings.
Salmon and Trout River, with Falls.
A Brook in the Woods. Lady Fishing.

# SPAIN.

There do not exist in Spain any deep-sea fisheries, properly so called the despatch of large fleets at certain periods of the year, and to co either at sea or on the coasts of savage or uninhabited lands, as it is the case when this country was possessed, or shared with other n dominion of the seas. Since those palmy days, when, as in th Philip II., two hundred vessels, with no less than 6000 sailors, left the shore for the cod fisheries of Newfoundland, these expeditions hav stantly declining, and have ceased altogether.

However, though in a different way, and resting on ancient rights o deep-sea fishery is coming to life again in this country, as is eviden Canary Islands, on the West Coast of Africa. There a company has b called the "Canario Africana," which is working the principal sh extensive scale, and establishing factories on the island of Graci archipelago.

With this exception, and without taking into account our importa fisheries, of which, owing to pressure of time in preparing this catal not been possible to procure data, the fisheries as carried on in Spain to what is technically known as coast fishing. Nevertheless it observed that, on the ocean coasts, this description of fishery, both i the number and tonnage of the craft, and the distance they go from t certain points, is, in a way, as important as deep-sea fishing is in ce maritime countries. In the Gulf of Gascony there are steamers t about fifty or sixty miles off the coast to compete with the French certain shoals, using a fishing instrument called "bou" by the Spa "chalut" by the French, both showing but little wisdom in thus trawling apparatus, which will end by destroying the fish which are be found on the shores of this gulf in both countries.

On the Cantabrian coast sailing boats and row boats go out to th tance, although it is impossible to define the existence of shoals prop ing, because, what with the species of fish native to the shore migratory fish, the whole coast may be said to yield a large produce, the same degree as the adjoining coast at the Punto la Estaca, wher the numerous rivulets and streams, and the large quantity of veg animal matter which they bring with them, attracting various spec the entire coast of Galicia may be described as one continuous shoal these channels are the spawning grounds and principal centres.

At the mouth of the Mino ends the first fishery division of the North West, which covers an extent of 1567 kilometres, and at the m Guadiana begins the second zone or division, which terminates at the Gibraltar, extending over 204 kilometres. This second zone, though not inferior in its yield of fish, as is proved by the fact that an impor lishment (in the island of Christina) has sprung up in a few years. rivers and streams, flowing through fertile regions, provide abundan ment for the fish, which breed and migrate; and there likewise some trawl with the tackle known as "bou" up to the African coast, comp the sailing craft in the shallow waters of this region, which is the c the Mediterranean.

All the sea coast, between the Campo de Gibraltar and the Fren extending over 1,149 kilometres, forms the third zone, the poorest

produce, although nature points to the contrary, as in every respect this sea possesses greater advantages for the breeding of fish than the European or Atlantic Ocean. The explanation of this enigma is already familiar to the more important nations which share these waters; it is undoubtedly the absurd manner in which these fisheries are worked, or rather overworked; and although this may not perhaps be the proper place to do so, we cannot resist availing ourselves of the opportunity of pointing out to the various nations interested, the expediency of convening a congress to discuss this matter, which it will soon be impossible to deal with efficaciously, as all maritime nations are now sadly misusing the lavish natural gifts of the ocean to the various countries along its shores.

The Government aid to the fishing industry is limited to encouraging initiative by publishing the works of those who distinguish themselves in foreign countries, granting honorary rewards to those who in any way contribute towards proficiency in this line, creating a model establishment for the propagation of oysters and for pisciculture, for which the State provides accommodation gratuitously, and relieving fishermen from taxes in the exercise of their calling. There are some co-operative societies of fishermen.

The fishery products on the coasts of Spain for the year 1882 are estimated at 79,540,165 kilogrammes, the number of men employed was 59,974, and of boats 14,202, with a tonnage of 51,397. There are fifty private establishments, which produced in the same year 7,591,198 kilos, and employed 1,430 men, and 297 boats, with a tonnage of 2,100. There are forty-three other establishments for the cultivation of oysters and other shell fish, and for pisciculture; but as they are in a primitive state, the produce is limited.

There are 535 establishments for salting and preserving, which produced this year 26,370,612 kilogrammes of fish, and employed 12,313 hands,—men, women, and children.

Exports for 1882.—Fresh fish, 533,665 kilos, of which 106,733 for Algeria, France, and Portugal. Salted, 545,031 kilos, representing 218,011 pesetas, for Algeria, Germany, France, England, Italy, Cuba, and the River Plate. Cured fish, 63,918 kilos, representing 51,134 pesetas, for Portugal, Brazil, and the River Plate. Salted and pressed sardines, 3,300,064 kilos, representing 1,650,034 pesetas, for Germany, Algeria, France, England, Italy, Portugal, Cuba, Puerto Rico, Brazil, Columbia, the United States, Mexico, Peru, Uruguay, Venezuela, the Philipine Islands, and British Possessions in China. Shell fish, 167,653 kilos, value 50,296 pesetas, for Algeria, France, Portugal, and River Plate.

The most important export is that of preserved fish, but as in the Customs Returns it is classed with other preserved alimentary products, it is not possible to furnish reliable data in this respect.

TABLE *showing the weight and value of fish exported from Spain during the year* 1882, *with the countries of destination.*

Fresh Fish.

| Country to which sent. | Quantity. | Value. |
|---|---|---|
| | Kilogrammes. | Pesetas. |
| Algeria .. .. .. .. .. | 1,600 | 320 |
| France .. .. .. .. .. | 209,310 | 41,860 |
| Portugal .. .. .. .. .. | 322,755 | 64,551 |
| Total .. .. .. | 533,665 | 106,733 |

TABLES *showing the weight and value of fish exported from Spain during t year* 1882, *with the countries of destination.*

PICKLED FISH.

| Country to which sent. | Quantity. | Value. |
|---|---|---|
| | Kilogrammes. | Pesetas. |
| Algeria .. .. .. .. .. | 20,260 | 8,104 |
| Argentine Confederation .. .. | 506 | 202 |
| Cuba .. .. .. .. .. | 3,353 | 1,341 |
| England .. .. .. .. .. | 96,800 | 38,720 |
| France .. .. .. .. .. | 8,481 | 3,392 |
| Germany .. .. .. .. .. | 420 | 168 |
| Total .. .. .. | 545,031 | 218,011 |

CURED FISH.

| Country to which sent. | Quantity. | Value. |
|---|---|---|
| | Kilogrammes. | Pesetas. |
| Argentine Confederation .. .. .. | 5,372 | 4,217 |
| Brazil .. .. .. .. .. | 462 | 370 |
| Portugal .. .. .. .. .. | 58,084 | 46,467 |
| Total .. .. .. | 63,918 | 51,134 |

SARDINES, SALTED AND PRESSED.

| Country to which sent. | Quantity. | Value. |
|---|---|---|
| | Kilogrammes. | Pesetas. |
| Algeria .. .. .. .. .. | 182,062 | 91,031 |
| Argentine Confederation .. .. .. | 3,510 | 1,756 |
| Brazil .. .. .. .. .. | 7,014 | 3,507 |
| British Possessions in Asia .. .. | 1,080 | 540 |
| Colombia .. .. .. .. .. | 106 | 53 |
| Cuba .. .. .. .. .. | 258,172 | 129,086 |
| England .. .. .. .. .. | 73,750 | 36,875 |
| France .. .. .. .. .. | 2,372,194 | 1,186,097 |
| Germany .. .. .. .. .. | 3,745 | 1,873 |
| Italy .. .. .. .. .. | 308,420 | 154,210 |
| Mexico .. .. .. .. .. | 1,697 | 849 |
| Peru .. .. .. .. .. | 18 | 9 |
| Philippine Islands .. .. .. | 1,717 | 859 |
| Porto Rico .. .. .. .. . | 21,511 | 10,755 |
| Portugal .. .. .. .. .. | 44,293 | 22,147 |
| United States .. .. .. .. | 516 | 258 |
| Uruguay .. .. .. .. .. | 18,050 | 9,025 |
| Venezuela .. .. .. .. .. | 2,209 | 1,104 |
| Total .. .. .. | 3,300,064 | 1,650,034 |

ABLE *showing the weight and value of fish exported from Spain during the year* 1882, *with the countries of destination.*

SHELL FISH.

| Country to which sent. | Quantity. | Value. |
|---|---|---|
| | Kilogrammes. | Pesetas. |
| Algeria .. .. .. .. .. | 5,100 | 1,530 |
| Argentine Confederation .. .. | 115 | 35 |
| France .. .. .. .. .. | 162,173 | 48,651 |
| Portugal .. .. .. .. .. | 265 | 80 |
| Total .. .. .. | 167,653 | 50,296 |

## LIST OF EXHIBITORS.

### DIVISION I.

**Gear of every description and of all nations used in trawl, herring, long line, hand line, and every other mode or system of fishing, including all nets, lines, hooks, harpoons, tackle, &c., employed in the same.**

**NAVAL MUSEUM.**

Drag Net, wide mesh.
Ditto, close ditto.
Ditto, Mar menor (Inland Sea).
Ditto, "Cariño."
Two ditto, Coast of Valencia.
Specimen of mesh of net—Terraria.
Ditto, material of net.
Ditto, of Net.
"Endecha."
Model of "Gola."
Pattern of mesh—Artó.
Ditto, "tela."
Ditto, "Gambera."
Ditto, "Tarralla."
Ditto, "tiro de hondura."
Model of "ter de fondo."
Ditto, "Terraria."
Ditto, "Arto."
Ditto, "banda de fila."
Ditto, Trammel from "Aguadilla," for turtle.
Ditto, ditto, Coriño.
Ditto, ditto, Carthagena.

**NAVAL MUSEUM.**—*continued.*

Pattern of Trammel of Guadalquivir, for shad.
Ditto, ditto, for pike.
Ditto, ditto, for "cordallo."
Ditto, ditto, for shad.
Pattern of mesh of trammel, Valencia.
Ditto of Net Line.
"Llampuera."
"Cerco Real" (Model).
Portion of mesh, "cerco real," natural size.
Example of a species of drag net ("traiña").
Casting machine ("tribuquete") natural size.
Pattern of the kind of nets used in Drag-Net Fishing.
Samples of tackle known as "jeito" with accessories.
Example of Sardine net.
Ditto.
Pattern of mesh of this net, called second "boguera."
Tackle known as "Sardinal," Coast of Valencia.
Ditto, Carthagena.
3 samples of net called "Bou."
Pattern of meshes of "Bou" net, natural size.
Ditto ditto, Frisca.
Examples of meshes of net, 'Fisqueta.'
Ditto, ditto, 'Fiscot.'
Ditto, ditto, 'Gualero.'
Ditto, ditto, 'Modela.'
Ditto, ditto, 'Corona.'
Tackle "Bolante," used in estuaries for cod-fishing.

"Angarrello," Net used in estuaries for fishing Lobster, and fish of the turbot and bream species, &c.
"Garamallo de cariño."
"Rapeta."
Tackle "Aljarife" (natural size) used in Seville for fishing dace.
Ditto, "atajo" (natural size), from Guadalquivir, for the same kind of fishing.
Example of tackle known as "corredera fija," for catching shad.
Ditto, "Almadraba de Monte leva."
Ditto, "Almadravilla ó lisera."
Ditto, "Cielo ó Velo."
Ditto, "Agugera."
Ditto, "Broguera Savalera."
Ditto, "Armario."
Ditto, "Tarraya."
Samples of nets used by fishermen of the delta of the Ebro

2 Models of apparatus for coral fishing.

**VAL MUSEUM.**—*continued.*
"Palangre," "Los Enemigos" (Valencia).
3 Ditto, "Penchat."
Ditto, for fishing "Reis."
Ditto, for rocking fishing.
Ditto, for fishing "Restina."
Ditto, "Corbina."
Ditto, "Pagel," and lobster.
Ditto, Cod.
2 Ditto, Eels (Guadalquivir).
Ditto, "Besugo" (fish of the bream kind) and "Chichario."

Ditto, "Aligote" and "Ollomól."
6 accessories "Brasolados," for "palangre" of Mataró.
16 kinds of "anzuelos."
Apparatus for fishing "Pulpo."
5 classes of "Volantines."
Instruments (Picao para extraci el aire los pescodos).
13 specimens of tackle, "Volantines" of various kinds.
3 ditto "Croques."
3 ditto "Poteras."
8 ditto "Curricanes."
Buoys ("boyas") for tackle known as "palangre" (Galicia).
Buoys, cork, for ditto "palangre," Valencia.
Ditto, ditto, ditto "xeito," Vigo.
Corks prepared for floats (flotadores), Vigo.
Birch bark ditto, ditto.
Lead Weights for net lines, Vigo.
Ditto, Laredo.
Weight, "barro encarnado."
Ditto, Stone ("peladilla,") Caramiñal.
"Orcera." Apparatus for raising "Xeitos."
Model of apparatus for catching fish ("encañizada") "Mar Menor."
Ditto of Fish Pond.
4 Harpoons. D. Salvador Daniel.
Apparatus ("Rastro") for Oyster Fishing.
Ditto ("Treton") ditto.
Ditto ("Angazo") ditto.
Ditto ("Tanga") ditto.
Ditto ("Raño") ditto.
Artificial Bait.
Apparatus ("nasas") for eel fishing.
Ditto, for lobster fishing.
Model of apparatus ("nasas") used in Aguadilla (Puerto Rico) for fishing eels.
Ditto, for barbel and eels. Guadalquivir.
Ditto, for shrimps, ditto.
Ditto, tank for keeping live fish, ditto.
Ditto, apparatus for fishing "bogas." Valencia.

**NAVAL MUSEUM.**—*continued.*

Model of apparatus for fishing small cod.
Ditto, ditto conger eels, &c.

Apparatus ("nasas") for "Lepias" or "Givias." Valencia.

Ditto for fishing "Surel" and Llampuga." Valencia.

5 Models of apparatus ("Nasas") used for the same kind of fishing.
Model of automatic net, with two hydrogen-gas generators, invented and presented by D. Serapio Remes y Lubiano, of San Sebastian.
Apparatus for lobsters, with the same system of generator, invented by the same.
Horse-hair tackle, D. Pedro Duaneda y Torres, of Mahon.

Fishing-nets, from the Manufactory of D. Carlos, Pairo & Co., Barcelona.
Model of fishing apparatus ("Encañizada") from the "Mar Menor"), presented by D. José Perpen y Rodenas of San Javier (Murcia).
A Box containing a boat fitted with a light ("bote faro sub marino"), the various portions of same, and of the net by means of which it can be used for fishing purposes, with a description, presented by D. Carlos Soler y Plana, of Tarragona.

A Photograph representing coral fishing, presented by D. Juan Gorgoll y Barcelo, of Palafrugell ("Palamos").

2 Portions of net of equal mesh, such as are used in the apparatus "Cedazos de la Coruña," presented by Messrs. Moristany & Brother.
A descriptive account of the importance of the Sardine Fishery in Galicia, the description and form of the apparatus called "Cedazo"; the parts composing it; the agreements between fishermen and shipowners, &c., &c., presented by the same.

A Box containing different portions of nets of various kinds, presented by Messrs. Fabra & Co., of Barcelona.

A Box containing two samples of tackle ("Paños de Cazonal), presented by D. Francisco Mayor, of St. Lucar.

A Collection of specimens of cordage ("Menas") used for the tackle known as "Bou" and "Cazonal."
A Case containing a complete set of "Bou" tackle, with the exception of certain ropes and meshes, presented by D. José Tome, Sanlucar.

**NAVAL MUSEUM.**—*continued.*

Another, with various samples of Nets and Rope-work, presented by D. José Barrull, Barcelona.

Presented by D. Pedro Olier, Barcelona :—

2 Examples, unfitted ("siu armar"), forming four portions of Sardine nets.
Sample of net for "Cordonices."
A Sample of Net fitted for casting ("batir").
Another, unfitted, for trawling.
Ditto, fitted, called a "trammel." ("Trasmallo") for river fishing.
A snare ("Garlito"), large size.
16 ditto, small size.
20 small boxes with samples of nets.

2 Parcels ("palangres.")
A Parcel "brasolado."
Another, with 68 "brasolados."
A piece of hemp canvas.
Another of cotton stuff.
Lithograph representing nets fitted and ready for use.

Presented by the "Cordelera Española," Barcelona—

A specimen of tackle, "Volantin," 3 cane implements, 3 hanks of thread for sewing; 3 do. for fishing; 6 hanks of "Curricanes"; a harpoon, 2 clews for thread for fishing,
6 speciments "Palangres Surtidos."
A net, "Chinchorro."
Ditto "Lampuyera."
Various implements (trammel net, etc.).
A drag net, "Bou;" a net for tunny ("Almadravilla"); a sardine net; an implement for fishing coral, etc.
Piece of hemp for coral fishing.
Ditto flax for tunny fishing-net "Almadabra Real."
Ditto ditto, drag net.
2 Ditto for "Cuerda Doble."
Piece of Flax ditto ditto "Chinchorro."
Ditto ditto ditto "Ganguel."
Ditto ditto ditto "Heniguen para los boyas de lampuguera."
2 "Gambines," presented by D. Jaime Cañellas, Barcelona.

Coral, presented by the "Ayudantia de Marina" of Aleudia.

An apparatus for throwing harpoons, with fittings, presented by D. José de Zalvide y Sagarminaga, Bilbao (accompanied with a descriptive notice of the apparatus, and 2 photographs).

**NAVAL MUSEUM.**—*continued.*

Presented by the Association of Merchants of Lequeitio, Bilbao.

An Apparatus for Tunny.
Ditto ditto Tunny.
Ditto for Bream.
Tackle, "Palangre" for same.
2 examples of Tackle for Cod.
An Apparatus for Conger Eels.
Ditto Fish known as "Skate."
Ditto ditto "Pocha."
2 ditto ditto "Givia."
An Apparatus for "Berber y Chinchorra."
2 ditto "Ahujas."
An Apparatus for Cuttle Fish.
Ditto Lobster.
Model of a Fishing Net "Trama ó Cerco."
4 Models of Fishing Net.

3 Buoys ("Boyas" of various sizes and shapes, presented by Roberto e Ysern of Seville.
6 Pieces of cork.

Presented by D. José Guzman, Seville—
3 Parcels of Hemp.
Ditto Thread of Various Thickness.
A hank of Thread for Fishing.
Seven samples of Thread for Fishing Tackle.

## Division II.

### Oyster dredges, crab, lobster, prawn, &c., pots, and other appliances for catching fish of this description.

**NAVAL MUSEUM.**

Model of net mounted on rod so that one person can manage it.

2 Models of Salabras.

## Division III.

### Fishing craft of all nations; models and representations of the same.

(i.) Steam fishing vessels and steam carriers.

**NAVAL MUSEUM.**

Model of Fishing Steamer, with drawings presented by D. Antonio Mutiozabal-Aguinaga (San Sebastian).

## Division IV.

### Fishing vessels and boats other than steam vessels.

**NAVAL MUSEUM.**

Model "Valandras Viveros," Island of Cuba.
Ditto, boats used in the tunny-fishery.
Ditto, ditto, Corredera fija.
Ditto, ditto, Bou fishery, Valeria.
Ditto, ditto, ditto, Cadiz.
Ditto, (half-block), boat used in same, Valencia.
Ditto, (whole model), same as preceding, Puerto Sta. Maria.

Ditto, boats used in "Arte de Cachara," Barcelona.
Ditto, known as "Jamelo," La Guardia.
Ditto, a "Dorna" (a Galician fishing-boat), Rias Bajas.

Ditto a "Dorna," Rias Bajas.
Ditto, a Fishing-boat (felucca) of Mugardos.
Ditto, a Launch, Coruña.
Ditto, a Launch used in St. Marta, Barquero y Vivero.

Ditto, a Galleon of the same rias.
Ditto, a Boat for deep-sea fishing, Laredo.
Ditto, a Trawler, Cantabrico.
Ditto, a Fishing-boat, presented by the Maestro Civil Garcia; built as an experiment.
Ditto, a Maestro D. Audres Diaz.
Ditto, an "Ancon," or fishing-boat, Aguadilla.
Ditto, a Yawl, or fishing and merchant craft, Aguadilla.

Ditto, a Yawl, or fishing and passenger craft, Aguadilla.

Ditto, a "Cayuco" or fishing-boat, Aguadilla.
Ditto, a Boat.
Ditto, a "Casco," a merchant vessel of the Philippine Islands.

Ditto, a "Carambao," a passenger and fishing vessel of the Philippine Islands.
Ditto, a "Pontin," coasting vessel of the Philippine Islands.

Ditto, a "Parao" coasting vessel, of the Philippine Islands.
Ditto, a Fishing Boat of the Philippine Islands.
Ditto, a "Banca," fishing and passenger vessel of the Philippine Islands.
Ditto, a "Guilado," light passenger vessel of the Philippine Islands.
Plan of a proposed Boat for deep-sea fishing, presented by B. Fermin Mignel, Santandas.
Model of same.

**NAVAL MUSEUM.**—*continued.*

Descriptive statement relating to same.
Model of Sailing and Rowing Fishing-boat, with drawi
D. Antonio Mutiozabal, Aguinaga, St. Sebastian.
Model of Fishing-boat in Port Mahon.
Ditto. outside that port, both given
D. Pedro Ricza y Campo of Mahon.
Model of Boat for deep-sea fishing, given by the Associat
of Merchants of Leoquitio.
Two Boats, for Palangre.
Ditto, Sardine fishery.
Ditto, Bou.
Ditto, Nausas.

DIVISION V.

## Ropes and canvas suitable to fishing-vessels.

**NAVAL MUSEUM.**

Dressed Hemp, Raw (best), Valencia.
Ditto (second quality), Valencia.
White Tow or Oakum (second quality), for caulking.

Ditto, tarred, ditto.
Ditto, Alquitranada, ditto.
Ditto, Galicia, ditto.
Piece of Rope or Cable for grappling, Laredo.
Specimen of Tackle for Sounding, deep-sea fishing, Laredo.
Patterns of Tackle for sheets and bowlines of boats, Laredo.

Ditto, other accessories for same.
Ditto, for hoisting sails.
Ditto, Canvas for fishing-boat, Valencia.
Ditto, Material for three ropes, ditto.
Ditto, four, ditto.
Ditto, two, ditto.
Piece of Sedge (esparto) for cable or rope, ditto.
Raw Esparto, ditto.
Prepared ditto.
Twisted Flax for tackle of fishing-boats of Aguadilla.

Raw Flax.
A Box containing specimens of sail-cloth.

Three boxes containing various specimens of Canvas.

A Box containing various specimens of Hemp Linen a
Cotton (Cruzado.)
A Box containing various specimens of Tarred Canvas.

Another containing specimens of Sail Thread.

**NAVAL MUSEUM.**—*continued.*

Two Mahogany Boxes containing specimens of Canvas and Tarred Canvas.

Box containing specimens of Weft, Warp, Thread, and Hemp.

Another box containing specimens of Hemp, Spun Yarn, &c.

Ditto, containing specimens of Cable and Sails.

Ditto, containing Cables and Hawser, Alquitranada.

Specimens of Esparto of different sorts and manufacture, presented by D. Antonio Diaz y Ruiz, of Almeria.

Another Sample, of Messrs. M. Murray & Co., Almeria.

Various Samples of Hemp, D. Juan Padilla, Almeria.

Small sample of Esparto Cordage for various applications of fishing, D. Augustin Diaz y Ruiz, Almeria.

Two Samples of Esparto, Y. Juan Mercadel y Portela, Mahon.

Samples of Cotton and Hemp, D. José Ponseti Brothers.

Collection of examples of rigging, &c., from the Arsenal, Carthagena.

## Division VIII.

**Fishing tackle and netting in different stages of preparation, and machinery used for working up the raw material.**

**NAVAL MUSEUM.**

Specimens of Nets, machine-made at Barcelona.

Ditto, Thread from the manufactory of Messrs. Rivas Bros., Vigo.

Ditto, from the manufactory of Messrs. Domeneale Bros., Badalona.

Esparto tackle from the "Just" Manufactory, Alicante.

Ditto, from the "Coropera" Manufactory, Blanes.

Collection of Needles for making nets by hand.

Samples of Nails, coast of Valencia.

## Division IX.

**Life-Boats, their equipment, and life-saving apparatus of every description.**

Two Cork Jackets.

Four Copies of a Treatise on Saving Life.

**NAVAL MUSEUM.**—*continued.*

Ditto, of Report published in the year.

A Box for donations, presented by the Society for Saving Shipwrecked, Guipuzcoa (St. Sebastian).

Constructed by D. Antonio Boch and presented by the "Dip cion Provincial" of Seville :—

Two examples of Life-saving Apparatus or beds, made of c

A Jacket and Belt.

Two Bolsters or Bags, so constructed as to be used for sav life.

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## CLASS II.

## ECONOMIC CONDITION OF FISHERMEN.

### DIVISION XXI.

### Apparel and personal equipment.

**NAVAL MUSEUM.**

A Fisherman's Dress ("Traje"), presented by D. José Fort Vich, Barcelona.

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## CLASS III.

## COMMERCIAL AND ECONOMIC.

### DIVISION XXV.

### Preparation, preservation, and utilisation of fish, and forms of life included in Class V.

(*a*) For edible purposes—

i. Models of fish-curing establishments. Methods of, and models and representations of any appliances for, drying, curing, salting, smoking, cooking, &c.

**NAVAL MUSEUM.**

Implements used in the Salting Establishments on the Co of Galicia.

### DIVISION XXVI.

ii. Fish, dried, smoked, cured, salted, tinned, or otherwise prepared for food.

**NAVAL MUSEUM.**

Twenty-four samples of Sardines in Oil and Tomato presented by Messrs. Cacho & Son of Laredo (Santander)

**MUSEUM.**—*continued.*

se containing Sardines and Cuttle Fish, presented by same.

of Sardines, Cod, Bream, Conger Eel, Cuttle Fish, "Sea Duck," ("pato de mar ó unade).

of Anchovies, Sardines, and Bonitos pickled both from Eulogio Barrio, Laredo (Santander).

nes and Bream, D. Primitivo Fuentecillas Gonzales, redo (Santander).

nes and Cuttle Fish D. Juan Godoy Gual, of Vilianueva Arosa (Villagarcia).

n, Conger Eel.

er, Lampreys, Cod, Turbot, Oysters, Trout, &c., pre-ted by D. J. Caamaño & Co., of Voyal (Villagarcia).

x containing various Samples of Fish, Conger Eel, Bream, ttle Fish, trout, &c., presented by D. Alejandro Carreño ldes, manufacturer of Preserved Food, of Noya (Villa-cia).

x of Pressed Sardines, a Barrel of "Corbina," and a ss Vessel containing Sardines before pressing, presented the manufacturers, Messrs. Maristany and Brother, moters of Fishery, Coruña.

x containing Sardines in Oil, with Tomatoes, presented the manufacturers, Messrs. Alonso Barcena and Ojeda, Laredo (Santander).

us Samples of Fish of different kinds, presented by D. ancisco de Lumbreras y Otamandi, of Bilbao (from his nufactory "La Bilbaina").

, presented by D. Cesareo Garovilla, of Lequeito (Bilbao).

tto, presented by D. Fernando Perez (?) Cavariego, from manufactory in "Puerto de Fapia" (Oviedo).

## Division XXVII.

roducts prepared from fish, such as oils, roes, isinglass, &c.

**MUSEUM.**

se containing Flasks of Oil made from the Liver of the atein various stages, raw, refined, &c., &c., presented D. Desiderio Valcarcel y Dominguez, of Cudillero, Gijon.

x containing Spawn or Eggs of the Skate and another h ("Pardete"), from the Mar Menor, or Inland Sea, esented by D. José Perpen y Rodenas of San Javier urcia).

r with Sardine Oil, immediately after pressing, presented Messrs. Maristany and Brother.

**NAVAL MUSEUM.**—*continued.*

A Jar containing Lees of Sardine Oil, used in dealing with Tanned Leather, presented by the same firm.

Ditto, containing Sardine Scales, used as Manure.

A Case containing 3 white Glass Bottles of Medicinal Skate Oil (Lija), in its three primitive or natural forms. These fish are taken at a depth of from 500 to 600 fathoms in the Cantabrian Sea; presented by D. Diego de la Concha, Cudillero (Gijon).

A Jar of Oil made from the liver of the "Cazon" (? Tope), from San Lucar. With price. Presented by D. Rafael Ramos, San Lucar.

DIVISION XXVIII.

iv. Antiseptics suitable for preserving fish for food.

**NAVAL MUSEUM.**

A Case containing 3 Samples of Salt from the Salt Pits of Torreviaja (Alicante), Government property, presented by the "Direccion de Rentas Estacadas."

Samples of Salt from the Salt Pits of San Pedro del Pinatar, "Mar Menor," presented by D. José Perpen y Rodenas of San Javier, Murcia.

A Case with Sample of Salt from the River of the Bay of Cadiz, from the Society "Concierto Salinero de San Fernando" (Cadiz).

DIVISION XXIX.

(*b*) For other than edible purposes—

i. Oils, manures, and other products prepared from fish.

**NAVAL MUSEUM.**

Oil, extracted from Dolphin Fat, Canary Islands.

Ditto, extracted from Liver of the "Cherna" (? "Ruffe"), ditto.

Ditto, extracted from "Kelme," 1st distillation, ditto.

Ditto ditto ditto 2nd ditto ditto.

Sardine Scales (Manure).

Sardine Oil.

Manure ("Caloca").

Ditto ("Xébra").

DIVISION XXXII.

iv. Preparation and application of sponges, corals, pearls, shells, and all parts and products of aquatic animals, &c., to purposes useful and ornamental, with specimens.

**NAVAL MUSEUM.**

"Minchas," kind of Shell from which the ancients used to extract their purple.

Mother-o'-Pearl ("Nacar de Luceros") shells from Galicia.

Shells for preparing irridescent Mother-o'-Pearl.

**AVAL MUSEUM.**—*continued.*

Mother-o'-Pearl, Aliotis.

Shell of Turtle or Tortoiseshell ("Carey") polished, (with a view to making known this product of ornament).

Three Specimens of Coral, unprepared, presented by D. Juan Barcelo de Palafrugell (Palamos).

Twenty-three shells of various kinds, presented by the same.

Seven "Star Stones" (Axterias), of various kinds, presented by the same.

Eight Shells ("Caracoles"), presented by the same.

nhells, "Flores del Punto," presented by the same.

Specimens of Sponges, unprepared, presented by the same.

Cuttle fish "Pluma de Calamar," presented by the same.

DIVISION XXXIII.

**Transport and sale of fish.**

(a) Appliances for carrying fish and for preserving fish during transport or erwise, and models of the same.

**AVAL MUSEUM.**

Collection of Barrels of Chestnut and other wood for pickling fish.

A Case, containing casks, barrels, tubs, &c., presented by J. José Arandia y Garcia.

Two Barrels of different make, presented by D. Ramon Montserrat, Pueblo Nuevo del Mar, Valencia.

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CLASS V.

NATURAL HISTORY.

[AQUARIA.]

DIVISION XLVI.

**pecimens living (marine and fresh water), fresh, stuffed or preserved, casts, drawings, and representations of—**

(e) Mollusca of all kinds, and shells not included in Class III.

**AVAL MUSEUM.**

Collection of Spanish Mollusca.

Ditto. Oysters.

DIVISION XLVII.

(f) Starfishes, sea urchins, holothuria.

**AVAL MUSEUM.**

Five Specimens presented by D. Juan Gorgoll y Barcelo, Palafrugell (Palamos).

DIVISION L.

(*i*) Crustacea of all kinds.

**NAVAL MUSEUM.**

Twelve Specimens of various species, presented by D. Gorgoll y Barcelo, Palafrugell, Palamos.

DIVISION LI.

(*k*) Fish of all kinds.

**NAVAL MUSEUM.**

Piece of Planking from the vessel "Niña Regina," of vieja, Master, José Valenti, with part of the sword of (sword fish) which pierced this plank at 9 p.m. on t July 1864, at more than 35 miles off the coast of Alge her way to Spain.

Piece of Planking from a coasting-schooner of Habana, p by a sword fish in 1853.

A Case containing various kinds of fish and eggs (s from the "Mar Menor," presented by D. José Pe Rodenas, of San Javia, Murcia.

Two Flying Fish ("peces-plumas"), presented by D. Gorgoll y Barcelo, of Palafrugell, Palamos.

A Fish, presented by the same.

Two Sea-horses, presented by the same.

DIVISION LII.

(*l*) Reptiles, such as tortoises, turtles, terrapins, lizards, serpents newts, &c.

**NAVAL MUSEUM.**

Sea Turtle. Turtle "Carey."

Ditto ("Tortuga fanduca ó Franca").

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CLASS VI.

HISTORY AND LITERATURE OF FISHING—FISH I —FISH COMMERCE.

DIVISION LVIII.

**Fishery laws of different countries.**

Annual of the Spanish Society for Saving Life at Sea.

Regulations for Lake Fisheries "Mar Menor."

Ditto for Developing and Improving Shell Fish Fis ("Mariscos.")

Ditto relating to Tunny Fisheries.

Annual of the Permanent Commission of Fisheries for Works and Notices relating to the Fishing Ind prepared by special order by D. Cesareo Fernandez.

Ditto for 1869.

## Division LX.

**orts, statistics, and literature of fish, fishing, and fisheries.**

**VAL MUSEUM.**

Practical Manual of Pisciculture, written by order of His Majesty, by D. Mariano de la Paz Graells.

Notice on "Pisciculture," written on behalf of the Central Fisheries Commission, D. Mariano de la Paz Graells.

Notice on the fishing industry, and the laws affecting it, from the year 187 to 1874, prepared by D. Javier de Salas and D. Francisco Garcia Sola.

Ditto, from 1874 to 1879, by D. Francisco Garcia Sola.

Five volumes of the Historical Dictionary of National Fisheries, by D. Antonio Sañez Reguart.

A collection of products of the Spanish seas (Vol. I.), by the same.

Notice on "Pisciculture," presented by the author, Sr. D. Mariano de la Paz Graells.

Practical Manual of Pisciculture, rewarded at several Exhibitions, presented by the author, Sr. D. Mariano de la Paz Graells.

A description of various specimens of Natural History, more especially relating to the sea, written by D. Antonio Parra, and presented by D. Mariano de la Paz Graells.

"Arte Cisoria," a treatise, written in 1870 by the Marquis Villeva D. Enrique de Aragon.

A treatise on Natural History, &c., 1603, written by Gerónimo de Huerta, Doctor of Medicine and Philosopher, and presented by D. Mariano de la Paz Graells.

A work on the Scientific Exploration of the N. W. coasts of Spain, written by D. Mariano de la Paz Graells, and presented by him.

A Proof or Essay of a History of Fishes, written by Don José Cornide, presented by D. Mariano de la Paz Graells.

A Descriptive Notice of the "Mar Menor," and the various Branches of Industry connected therewith, written by D. José Lopez Cortés, presented by D. José Perpen Rodenas, of San Javier (Murcia).

The following objects which are mentioned in the Catalogue have remained ain :—

| | |
|---|---|
| Division 1 | No. 134 |
| " 4 | No. 4 |
| " 5 | Nos. 7, 8, 9, 10, 11, 12, 13, 14, 15, 16, 19 and 20. |
| " 8 | No. 1. |

# SWEDEN.

Owing to the fact that Sweden, which is almost entirely surrounded by (its coast-line is 2,500 kilom.), has a great many rivers and streams, and to Finland, the greatest number of lakes of any country in Europe, (one-tw of the area of Sweden consists of water)—the very nature of the country m it peculiarly adapted to fish-culture; and hence it follows that its f grounds ought to be one of the chief sources of the trade and indus Sweden.

The waters of the coasts differ considerably from one another, as well as the waters of the lakes, a circumstance which causes varieties in the fish i The number of known species of fish in Sweden is at present about 1 which, however, only about 50 are commonly caught for use. The important fisheries are:—

A. *The Herring and Sprat Fisheries of the Baltic and the West Co* These, no doubt the most important fisheries, are carried on from the n part of the Gulf of Bothnia as far as the northern part of the province of B The nets used by the fishermen are standing nets (*sältgarn*), seines (*vadar* driftnets (*drifgarn*). The boats used in the Baltic are mostly open, and h crew of two to three men; on the west coast the boats used in drift-fishin decked, and have from three to five men. Seine fishing requires at least ten to fifteen men for each seine.

On the western and southern coasts of the country the herring fish generally carried on by a population living together in large fishing vil and obtaining their subsistence solely from the fishery. But along the of the inner Baltic from Kalmar to Haparanda, as well as the coast of the of Gotland, the herring fishery is carried on partly by people who live interior and only visit the archipelagoes during the fishing season, and by fishermen from the various islands.

The Baltic herring (*strämming*), a smaller variety of *Clupea harengus* sold either fresh in the towns along the coast, or else salted in barrels. barreled article is generally sold in Sweden—salted herring being the food of the Swedish peasant; but of late years it has also been expo Germany.

Herrings (*Clupea harengus*) and sprats (*Clupea sprattus*) are also c especially of late years, during the autumn and winter months, in the S Rack, on the coast of the province of Bohus. The herrings are partly sold and partly salted in barrels or smoked. The sprats likewise are partly fresh, and partly pickled or spiced, while some are prepared as "anch and sold under that name, although of course they are a different kind from the true anchovy. Considerable quantities of these have been exp during the last few years.

The yearly revenue of the herring and sprat fisheries of the whole co may be estimated in round numbers at 3,065,000 Swedish crowns, of which 2,650,000 is the revenue of the herring fishery in the Baltic and the Sound

B. *The Coast and Sea Fisheries (with the exception of the Herring, S Salmon and Eel Fisheries).*—Near the west coast and in the Baltic Se

lshery is carried on in small vessels, but on the banks in the Skager-Rack and off the west coast of Skagen and Norway in larger vessels, called *bank-smacks*, which have a crew of twelve or fourteen men. The tackle used for the bank-lshery is the "Stor-backa," a long line that is laid out on the banks, and often eaching to a depth of from 100 to 200 fathoms. As a bait either mussels or its of fish are used. With this tackle are caught the cod, coalfish and haddock (*Gadus morrhua*, L., *G. virens*, L., *G. aeglefinus*, L.), the ling (*Molva vulgaris*, ills.), the tornback (*Raja clavata*, L.), and the halibut (*Hippoglossus vulgaris*, uv.) Of the fish caught part is sold fresh, but the greater part is prepared "stockfish" or salted, either by Norwegian merchants or by fish-curers in the ovince of Bohus. From the liver "codliver oil" is prepared, and the roe is lted to be afterwards sold for bait to the sardine fisheries in France.

The annual revenue of these fisheries in Skager-Rack, together with the venue of the mackerel and the lobster and oyster fisheries carried on in the ovince of Bohus, is computed at 1,339,500 Swedish crowns. Besides this, the tistical reports from the province of Scania give the value of this fishery at 8,600 Swedish crowns; and as no statistical reports concerning the fishery in estion in the other provinces are to be had, it may for these provinces, without aggeration, be estimated at an annual sum of 351,900 Swedish crowns, which kes the annual revenue of these fisheries for the whole kingdom, in round mbers, 2,000,000 Swedish crowns.

C. *The Lake and other Freshwater Fisheries*, with the exception of the lmon fishing, are, in the south and central parts of Sweden, carried on princi-lly for the perch (*perca fluviatilis*, L.), the pike perch (*Lucioperca sandra*, v.), the pike (*Esox lucius*, L.), the bream (*Abramis brama*, L.), and other hes of the carp tribe, as well as for the burbot (*Lota vulgaris*, Cuv.), the eel (*Anguilla*, L.), the lampern (*Petromyzon fluviatilis*), and the smelt (*Osmerus eperlanus*). A tolerably good income in these parts of Sweden, th the exception of the westernmost districts, is also to be had from cray-sh (*Astacus fluviatilis*), which are often very numerous in the smaller lakes d rivers. In the lakes in the north of Sweden especially are caught some ecies of the genus *Coregonus*, and also the above-mentioned species. The heries in the lakes are carried on as a livelihood by a population of fisher-en residing on the shores; as a subordinate pursuit by farm people, cottagers, tisans and soldiers, who either possess fishing-licenses or have procured such agreement. The products of these fisheries are mostly disposed of in a fresh ate in the neighbourhood of the fisheries, but of late years part of them have en preserved in ice and exported to Germany. The reports concerning the venue of these fisheries are very incomplete, but the annual revenue of all the ke and freshwater fisheries has been, estimated in round numbers at 2,000,000 edish crowns, which is no doubt much too little.

D. *The Salmon Fisheries.*—The richest of the many salmon-streams of eden are the Torne, Lule, Ume, Angerman, and Ljusne rivers in Norrland, d the Viska, Atran, Nissa, Laga and Qvistrum in the west of Sweden. The lmon fisheries are carried on in the Norrland rivers from the end of May til the beginning of September; in the rivers of the west of Sweden from the eginning of April until the middle of July, and along the coasts of Scania and lekinge in the winter months, if the ice does not prevent. The largest lmon fisheries in the country are those at Elfkarleby in Upland, and is orrum in Blekinge. The salmon caught in the rivers on the west coast is onsidered better than the salmon taken in the rivers on the east coast, and at

quite as good as the Scotch. The salmon is now-a-days mostly sold fresh, eith in Sweden or abroad, in which latter case it is packed in ice and exported, v Stockholm, Gothenburg, or Malmö, by wholesale houses to England and Germa especially to Berlin. The greater part of the salmon taken on the south coast Sweden in winter is sent to Germany or Denmark to be smoked. The ann revenue of our salmon-fisheries may safely be estimated at 625,000 Swed crowns.

E. *The Eel Fishery (with Traps on the Coasts).*—Very high prices being p for the eel, the catching of this fish will become one of the most valuable fishe of the Baltic. This kind of fishery is carried on from the town of Grisslehe as far as the western coast of the province of Scania. The eel is caught means of large traps (*hommor*), and the best time for catching it is in Septem and October. The annual revenue of this fishery may safely be estimated 150,000 Swedish crowns.

The value of all the fisheries of the kingdom, estimated approximately, judging from all appearances by no means too high, should, as shown abo amount to—

| | |
|---|---|
| A. Herring and Sprat Fisheries. . . . . | 3,065,000 |
| B. Coast and Sea Fisheries . . . . . | 2,000,000 |
| C. Lake Fishery . . . . . | 2,000,000 |
| D. Salmon Fishery . . . . . | 625,000 |
| E. Eel Fishery with Traps . . . . . | 150,000 |
| | 7,840,000 |

For the *Superintendence and Improvement of the Fisheries* the followi officials are appointed:—

An Inspector of the fisheries in fresh waters and on the east coast Sweden, with two assistants and one instructor in fish-breeding. Besides the government fishery officials, there are, in certain provinces and wate fishery *overseers* appointed, whose chief duty is to see that the enactment relating to fisheries are observed. Of these overseers some are paid by gra from the State, others by "Landsting" and agricultural societies, conjoint with the owners of the fishing waters.

The direction and superintendence of the sea-fishery on the west coa of the kingdom, is entrusted to an overseer, who is under the control of t Governor of the governmental district of Gothenburg and Bohus.

For the encouragement of fisheries the government for some years pa premiums to sea-going fishing-smacks from the province of Bohus, and in t last few years it has made effective attempts to introduce drift-net fishing the herring-fishery off the Bohus coast, as well as in the Gulf of Bothn Through the liberality of the Parliament it has also been possible of late yea to contribute considerable sums for the construction of several ports for t fishing trade.

Besides this, the Royal Agricultural Societies of the different governmen districts contribute from their funds to the expenses of promoting the fishe interests of their respective districts.

In 1869 a company was established, with the aid of the Royal Agricultur Society of that district, for insuring fishing vessels and gear for the governmental district of Gothenburg and Bohus; and this company still carries on it operations.

# LIST OF EXHIBITORS.

## CLASS I.—SECTION I.

## FISHING.

[SEA FISHING.]

### DIVISION I.

**Gear of every description and of all nations used in awl, herring, long line, hand line, and every other mode r system of fishing, including all nets, lines, hooks, arpoons, tackle, &c., employed in the same.**

**NDERSSON, GÄCK J.**, Fisherman, Råå, Raus, Province of Scania (Skåne).
Eel Line.
Long Lines for Codfishing.
Plaice Net, new.
Herring Net.
Half of Cod Net, of flax.
Cod Hook ("Pilk").
Cod Hook (small).

**NDERSSON, N.**, Sub-Inspector of Fisheries, Åhus, Province of Scania (Skåne).
Eel Trap ("Ryssja").

**NDERSSON, LUND. O.**, Fisherman, Refhusen, Ystad, Province of Scania (Skåne).
Herring Net with meshes.
Do. Net of different size.
Cod Net.
Salmon Net.
Long Line for Salmon Fishing.
Cod Line.
Long Line for catching Flounder and Guffer-eel (*Zoarces viviparus*).
Bunt belonging to Sand-eel Seine, of netting, half natural size, but with the meshes natural size.

**'ARCTIC OCEAN" (THE) COMPANY**, Gothenburg. (Aktiebolaget Ishafvet Göteborg).
Express Rifles.
Seal Clubs.
Flaying Knife, with sheath and steel used in whetting.

Towing Harness and Line, for dragging killed Seals on the Ice.

**ARESCHOUG, O.**, Landed Proprietor, Esperöd, Kivik, Province of Scania (Skåne).
Eel Trap ("Ålhomma"), with map showing the extent of the Fisheries and manner of setting the Gear.

**ÅSTRÖM, H.**, Fisherman, Kivik, Province of Scania (Skåne).
Various Fishing Gear.

**BACKE, N.**, Boat-master, Råå, Raus, Province of Scania (Skåne).
Net of Home-spun Linen Yarn, made 22 years ago in the fashion then used.

**BERGIUS, G.**, Inspector of Fisheries for the Provinces of Gestricia (Gestrikland) and Helsingia (Helsingland), Gefle.
Two Standing Nets for catching Herring in the Baltic ("Klumpskötar") complete.
Drift Net from Gotland, experimentally used in Drift Fishing on the coast of the Provinces of Gestricia (Gestrikland) and Helsingia (Helsingland).

**BJÖRK, N.**, Sub-Inspector of Fisheries, Råå, Raus, Province of Scania (Skåne).
Eel Trap or Hoop Net ("Ålrusa").
Cod Net of Cotton.
Herring Net.
Cod Line.
Whiting Line.

**BOBERG, F.**, Fisherman, Skillinge, Simrishamn, Province of Scania (Skåne).
Salmon Line (Long Line for Salmon Fishing in the Baltic).

**CHRISTERSON, C.**, Light-ship Keeper, Falsterbo, Province of Scania (Skåne).
Sand Eel Seine.

**CHRISTIANSSON, C. J.**, Merchant, Olofsholm, Malmön, Province of Bohus (Bohuslän).
Long Line ("Storbacka") for catching Lingfish and Cod.

Long Line ("Skrejbacka") for Cod Fishing.
Long Line called a Haddock Line ("Koljebacka") for catching Haddock and small species of Codfish.

Mackerel Net. Mackerel Line. Mackerel Line.

**EXECUTIVE COMMITTEE (THE) OF THE ROYAL AGRICULTURAL SOCIETY OF SOUTH WESTROBOTHNIA** (Vesterbottens Läns Kongl. Hushållnings Sällskaps Förvaltnings Utskott). Umeå.
Standing Net ("Sköt") for catching Herrings in the Baltic.

Part of Salmon Net.

**NRICKSSON, A.**, Fisherman, Borstahusen, Landskrona, ovince of Scania (Skåne).
Cod Net, new and untanned, of flax.

**KANSSON, A.**, Fisherman, Sub-Inspector of Fisheries, näbäck, Maglehem, Province of Scania (Skåne).
Eel Trap ("Ålhomma").

**LUND, L.**, Fisherman, Hudiksvall, Province of Helsingia Helsingland).
Model of Great Trap ("Stor-ryssja").

**IASSON, P.**, Fisherman, Råå, Raus, Province of Scania kåne).
Flounder Net.
Cod Net.
Cod Hooks.

**PSSON, L.**, Fisherman, Baskemölla, Simrishamn, Province Scania (Skåne).
Sand Eel Seine.

**ISSON, L.**, Fisherman, Kåseberga, Svenstorp, Province of ania (Skåne).
Eel Trap.

**RSSON, A.**, Fisherman, Råå, Raus, Province of Scania kåne).
Model of Standing Net Trap ("Bottengarn").

**RSSON, C.**, Fisherman, Kråkvik, Valdemarsvik, Province of strogothia (Östergötland).
Model of Sprat (Swedish Anchovy) Seine.

**RSSON, P.**, Fisherman, Skillinge, Simrishamn, Province of ania (Skåne).
Herring Net.

**IBORG, H.**, Director of Fisheries for the Provinces of dermania (Södermanland) and Nericia (Nerike).
Eel Trap ("Ålhomma").

**NSSON, S.**, Fisherman, Nybro, Svenstorp, Province of Scania kåne).
Part of Sand-Eel Seine with appurtenances.

**RTENSSON, O.**, Fisherman, Käseberga, Svenstorp, Province Scania (Skåne).
Cod Lines.

**SSON, J.**, Fisherman, Råå, Raus, Province of Scania (Skåne).
Herring Net.
Cod Hooks.

**SSON, N.**, Fisherman, Skillinge, Simrishamn, Province of ania (Skåne).
Cod Line.

**NILSSON, P.**, Fisherman, Kivik, Province of Scania (Skå
Various Fishing Gear.

**OLSSON BOSE, M.**, Fisherman, Råå, Raus, Province of
(Skåne).
Cod Net.

**OLSSON, M.**, Fisherman, Hvitemölla, Brösarp, Provin
Scania (Skåne).
Herring Net.
Salmon Net.
Flounder Net.
Long Line for Salmon Fishing in the Baltic.

**OLSSON, S.**, Fisherman, Råå, Raus, Province of Scania (S
Mackerel Net, tanned, used.
Mackerel Net, untanned, new.
Drift Net for Herring Fishing, tanned, used.
Drift Net for Herring Fishing, untanned, new.
Bottom standing Net, tanned, new.
Flounder Net, untanned, new.
Plaice Net, new.
Plaice Net, tanned, used.

**ÖRNBERG & ANDERSSON**, Gothenburg (Göteborg)
of the Foglavik Glassworks in Westrogothia (Vestergötla
Glass Floats for Nets and Long Lines.

**ÖSTERGREN N.**, Fisherman, Skillenge, Simrishamn, P
of Scania (Skåne).
Flounder Net.

**ROYAL AGRICULTURAL SOCIETY OF THE
VINCES OF GESTRICIA (GESTRIKLAND)
HELSINGIA (HELSINGLAND)**, Gefleborgs Läns
Hushållnings Sällskap. Gefle.
Seal Trap ("Skältina").

**ROYAL SWEDISH AGRICULTURAL ACADEMY**
Landtbruksakademien) Stockholm.
Drift Net from Scania (Skåne) for Salmon Fishing
Baltic.
Flounder Net from Halland.
Herring Nets from Halland.
Herring Nets from Gotland.
Standing Net ("Sköt") for catching Herring, used
Stockholm Coast.
Herring Net from Bleking.
Herring Nets.
Standing Nets, used in the Herring Fishery off the C
Stockholm.
Deep-water Standing Net from the Herring Fisher
Norrland.

**ROYAL SWEDISH AGRICULTURAL ACADEMY—** *continued.*

Seal Net.
Sand Eel Seine, with cloth bag.
Seine from the neighbourhood of Stockholm.
Seine.
Seine.
Model of a Seine.
Model of Salmon Seine from the Baltic Coast of Scania (Skåne).
Eel Trap, combined with Hoop and Bow-Net, from Misterhult in the Province of Småland.
Model of Eel Trap from Scania (Skåne).
Cod Lines from the Province of Bohus (Bohuslän).

Cod Hook.
Long Line for catching Ray, from Gullholmen, Province of Bohus (Bohuslän).
Long Lines from Gullholmen, Province of Bohus (Bohuslän).

Thick Long Line for catching Ling, from Gullholmen, Province of Bohus (Bohuslän).
Long Line from the Province of Bohus (Bohuslän).

Long Line used at winter-fisheries ("Borrebacka") from Gullholmen, Province of Bohus (Bohaslän).
Long Line, used at summer-fisheries for Ling, on the Ocean-bank, "Storeggen," off the Norway Coast, from Bovallstrand, Province of Bohus (Bohuslän).
Long Haddock-Line, from Lysekil, Province of Bohus (Bohuslän).
Long Line for Haddock-fishing on the Ocean Banks in the North Sea, from Gullholmen, Province of Bohus (Bohuslän).
Long Haddock Line.
Long line.
Long Cod Line.
Long Lines.
Long Line for Salmon-fishing in the Baltic, from Simrishamn, Province of Scania (Skåne).
Model of Bottom Net Trap ("Bottengarn") from Scania (Skåne).
Model of Trap (of netting) for taking Seals ("Stagnät"), from Fårö, Gotland.
Model of Trap ("Katsa") made of wooden splints, used in the neighbourhood of Stockholm.
Fish Spear.
Buoys from the Province of Bohus (Bohuslän).
Water Telescope, from the Province of Bohus (Bohuslän).

Rollers attached to the gunwale of boats, for paying-in lines, from the Province of Bohus (Bohuslän).

**ROYAL SWEDISH AGRICULTURAL ACADEMY**—*continued.*

Grapnels, from the Province of Bohus (Bohuslän).

Hand Line for Codfishing, and Drag Line for catching Pike, from the Province of Bleking.

Eel Trap ("Ål-ryssja"), from the Province of Bleking.

Salmon Line, from the Province of Bleking, used in the Baltic.

Cod Line, from the Province of Bleking.

Herring Net, from the Province of Bleking.

Flounder Net, from the Province of Bleking.

Hook Tangle ("Pimpeldon") Hand Line implement with radiantly placed hooks on snoods, for snatching the fish without bait.

Great Trap Net with arms, from the Baltic.

**SÖRENSON, N.**, Fisherman, Limhamn, Malmö, Province of Scania (Skåne).

Long Line with 100 Hooks for taking Eel and Cod.

**SVENSK, J.**, Fisherman, Innantjära, Kilafors, Province of Helsingia (Helsingland).

Net.

**SVENSSON, B.**, Fisherman, Råå, Raus, Province of Scania (Skåne).

Plaice Net, new.

**SVENSSON, H.**, Fishermen, Arilds läge, Brunnby, Province of Scania (Skåne).

Herring Standing Net of home-spun linen yarn.

Cod Line of home-spun linen yarn.

**SVENSSON, N.**, Fisherman, Borstahusen, Landskrona, Province of Scania (Scåne).

Net and two kegs, new.

Net and two kegs, used.

Bottom Net.

Flounder Net.

Cod Net.

Cod Line.

Whiting Line.

Cod Hook ("Pilk").

Cod and Eel Line.

**SVENSSON, P.**, Fisherman, Borstahusen, Landskrona, Province of Scania (Scåne).

Cod Net, new, of cotton.

**VEDISH FISHING TACKLE COMPANY (THE)** represented by B. Danelius. (Svenska Fiskredskaps aktiebolaget genom B. Danelius) Stockholm.
Nets, Standing Nets, Herring Nets, Seines, &c.

**OOLOGICAL DEPARTMENT, ROYAL MUSEUM OF NATURAL HISTORY** (Naturhistoriska Riksmuseum) Stockholm.
Zoological Specimens.

DIVISION II.

**yster dredges, crab, lobster, prawn, &c., pots, and other other appliances for catching fish of this description.**

**NDERSSON GÅCK, J.,** Fisherman, Råå, Raus., Province of Scania (Skåne).
Prawn Seine.
Hand Net for Catching Prawn.
Worm Stamp for Lug-Worm.
Worm Comb ("Ormkam").
Whelk Basket ("Kongakupa").

**ERGSTRÖM, A.,** Fisherman, Limhamn, Malmö, Province of Bohus (Bohuslän).
Prawn Net.

**HRISTIANSSON, C. J.,** Merchant, Olofsholm, Malmön, Province of Bohus (Bohuslän).
Lobster Pot.

**USTAFSSON, P.,** Fisherman, By, Morshyttan, Province of Dalecarlia (Dalarne).
Lobster Pot of Brass-Wire.

**RISTENSON, A.,** Fisherman, Limhamn, Malmö, Province of Scania (Skåne).
Prawn Net, of a construction new at this Fishing Place.

**OYAL SWEDISH AGRICULTURAL ACADEMY** (Kongl. Landtbruksakademien), Stockholm.
Lobster Pot, from the Province of Bohus (Bohuslän).

Cray-Fish Baskets.
Oyster Dredges from the Province of Bohus (Bohuslän).

Oyster Tongs from the Province of Bohus (Bohuslän).

**VENSSON, H.,** Fisherman, Arildsläge, Brunnby, Province of Scania (Skåne).
Whelk Basket.

**SVENSSON, N.**, Fisherman, Borstahusen, Landskrona, Province of Scania (Skåne).
Prawn Trap.
Hand Net for Catching Prawn.

DIVISION IV.

**Fishing vessels and boats other than steam vessels.**

**BERGIUS, G.**, Inspector of Fisheries for the Provinces of Gestricia (Gestrikland) and Helsingia (Helsingland).
Model of Standing-Net Boat ("Skötbåt"), from the Coast off Gefle.
Model of Standing-Net Boat, from the Coast off Söderhamn.
Model of Standing-Net Boat from the Coast off Hudiksvall.

**CHRISTIANSSON, C. J.**, Merchant, Olofsholm, Malmön, Province of Bohus (Bohuslän).
Model of Boat for Mackerel Fishing ("Net Boat" "Garnbåt").

**EXECUTIVE COMMITTEE (THE) OF THE ROYAL AGRICULTURAL SOCIETY OF SOUTH WESTROBOTHNIA** (Vesterbottens Läns Kongl. Hushållnings Sällskaps Förvaltningsutskott, Umeå).
Model of a "Net Boat."
Model of a Boat for Seal Hunting in the Baltic, with various Appurtenances.

**HANSSON, L.**, Boat Builder, Limhamn, Malmö, Province of Scania (Skåne).
Model of Boat for Herring Fishing.

**HÅKANSSON, J.**, Fisherman, Kåseberga, Svenstorp, Province of Scania (Skåne).
Model of Fishing Boat.

**IGGLUND, L.**, Fisherman, Hudiksvall, Province of Helsingia (Helsingland).
Model of Standing-Net Boat ("Skötbåt").

**KLÄTH, E.**, Ship's Master, Strömstad, Province of Bohus (Bohuslän).
Model of the Drift Fishing Boat "Fredrik."

**MÅNSSON, S.**, Fisherman, Kivik, Province of Scania (Skåne).
Models of Boats.

**POUSARD, P. E.**, Keeper of the Lighthouse at Saltvik Point, Hudiksvall, Province of Helsingia (Helsingland).
Model of a Boat with Gear.

**ROYAL SWEDISH AGRICULTURAL ACADEMY** (Kongl. Landtbruksakademien, Stockholm).

Model of Herring Boat from the Coast off Piteå, Gulf of Bothnia.
Model of Boat from Gotland.
Model of Boat from Gotland.
Model of Boat from Bleking.
Model of Boat from Bleking.
Model of Herring Boat from Skillinge, Scania (Skåne).

Model of Mackerel Boat ("Dörjebåt") from the Province of Bohus (Bohuslän").
Model of Bank Boat for the Ocean Fisheries in the North Sea, from the Province of Bohus (Bohuslän).
Models of Shore Punt, Dory ("Knubbeka"), from the Coast of Halland.
Model of Ice-breaking Boat from Westrobothnia (Vesterbotten), used in Hunting the Seal or Sailing among the Ice

Model of Herring Boat from the Province of Bleking.

DIVISION V.

**Ropes and canvas suitable to fishing vessels.**

**EXECUTIVE COMMITTEE (THE) OF THE ROYAL AGRICULTURAL SOCIETY OF SOUTH WESTROBOTHNIA** (Vesterbottens Läns Kongl. Hushållnings Sällskaps Förvaltningsutskott, Umeå.)

Rope made from the Fibre of Pine.

**KAMPENHOF COTTON WORKS COMPANY (THE)** (Kampenhofs Aktiebolag) Uddevalla, Province of Bohus (Bohuslän).

Canvas of Cotton—Various Qualities and Breadths.

**PETTERSSON, J.**, Ropemaker, Uddevalla, Province of Bohus (Bohuslän).

Cables and Ropes.

**ROYAL SWEDISH AGRICULTURAL ACADEMY** Kongl. Landtbruks akademien, Stockholm.

Different Kinds of Rope.
Rope made from Hog's Bristle.
Seine Rope of Birch Bark, from Stensele, in Lycksele District, Lapland.
Ropes made from Pine-Roots, and used as Net Lines, from Stensele, in Lycksele District, Lapland.
Ropes made from Pine-Roots for Seine Lines, from Stensele, in Lycksele District, Lapland.
Seine Ropes of Pine or Fir-Root, from Stensele, in Lycksele District, Lapland.

## Division VI.

**Steam and hand capstans, compasses, barometers, telescopes, lights, lamps, fog horns, systems of signalling at night for fishing fleets and vessels, electric lights, luminous paint, and other equipment of fishing vessels, charts for fishermen.**

**ESKELUND, J. N.,** Station-master, Stånga, Province of Gotland.
System of Signalling at night for Fishing Fleets and Vessels.

**LEIDESDORFF FISHING-TACKLE MANUFACTORY (THE)** (Leidesdorffska Fiskredskaps Fabriken), represented by the owner, E. Leidesdorff, Stockholm.
Patent Sub-aqueous Fishing Lantern.

**LINDBERG, L. F.,** Civil Engineer, Stockholm.
Self-revolving and Flashing Lighthouse Apparatus, with small lens adapted, patented (Fishing-light).

**ROYAL HYDROGRAPHICAL OFFICE** (Kongl. Sjökarteverket), Stockholm.
Charts.

## Division VII.

**Models of harbours, piers and slips, for fishing purposes.**

**HOLMBERG, H.,** Civil Engineer, Varberg, Province of Halland.
Charts of the Fishing Harbours in the South of Sweden.

## Division VIII.

**Fishing tackle and netting in different stages of preparation, and machinery used for working up the raw material.**

**BJÖRK, N.,** Sub-inspector of Fisheries, Råå, Raus, Province of Scania (Skåne).
Tools for the Manufacture of Fishing-tackle (Needles, &c.).

**THE KAMPENHOF COTTON WORKS COMPANY** (Kampenhofs aktiebolag), Uddevalla, Province of Bohus (Bohuslän).
Twisted Cotton Yarn, of various sizes and numbers of strands, for fishing-tackle (as Seines, Nets, Long Lines, &c.).

**OYAL SWEDISH AGRICULTURAL ACADEMY** (Kongl. Landtbruksakademien), Stockholm.
Snood-Spinner ("Nossil cock").
Spinning Machine ("Nossil Cock") from Scania ("Skåne").

Various Tools for manufacturing Fishing Tackle and Gear, such as Hook-benders, Knives, Netting Needles, Netting Pins, Hooks.

DIVISION IX.

**ife-boats, their equipment, and life-saving apparatus of every description.**

**LINLIN, J. F.**, Civil Engineer, Stockholm.
Life-boat, full size.

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CLASS I.—SECTION II.

FRESHWATER FISHING.

DIVISION XIII.

**almon nets and fixed appliances for catching salmonidæ in all their varieties.**

**NDERSSON, S.**, Manager of the Hammarö Fishing Company, near Karlstad, Province of Vermland.
Salmon Net.

**ERGIUS, G.**, Inspector ef Fisheries for the Provinces of Gestricia (Gestrikland) and Helsingia (Helsingland).
Models of the Salmon-fishery, with Locks and Weir, at Bergvik in Helsingia (Helsingland).
(*a*) Wooden Salmon-trap ("Laxkar").
(*b*) Wooden Salmon-trap ("Vrak-hus") with Locks.
Models of the Salmon-Fishery in the Ljusne River in Helsingia (Helsingland).
(*a*) Wooden Salmon-trap.
(*b*) Seine with windlass.
(*c*) Boat for use in streams.
Salmon Seine from the Ljusne River, in Helsingia (Helsingland).
Salmon Net from Färila in Helsingia (Helsingland).

Three models, showing the different methods of placing the nets in the Ljusne River.

**EXECUTIVE COMMITTEE (THE) OF THE ROYAL AGRICULTURAL SOCIETY OF SOUTH WESTROBOTHNIA** (Vesterbottens Läns Kongl. Hushållnings Sällskaps Forvaltnings Utskott) Umeå.

Models of Salmon Pen of Piles and Nets ("Laxpata").

Model of Salmon Trap ("Laxtina").

**GUSTAFSSON, P. E.,** Sub-Inspector of Fisheries, Ljusåsen, Smedjebacken, Province of Dalecarlia (Dalarne).

Salmon Trap.

**HOLMERTZ, N.,** Tenant of the Salmon Fishery (belonging to the Crown) of Motala, Province of Ostrogothia (Östergötland).

Exhibit showing the method of catching salmon in the Motala River.

**LEIDESDORFF FISHING-TACKLE MANUFACTORY (THE),** Stockholm, represented by the owner, E. Leidesdorff.

Salmon Rods.

**MÅRTENSSON, N.,** Fisherman, Kåserberga, Svenstorp, Province of Scania (Skåne).

Salmon Seine.

**POUSETTE, C.,** Elfkarleö, Province of Upland.

Model of Appliances for taking Salmon as used in the River Datelfven.

**ROYAL AGRICULTURAL SOCIETY OF THE PROVINCES OF GESTRICIA** (Gestrikland), and Helsingia (Helsingland).

Model of a Salmon Trap with Locks and Weir, at Gefle in Gestricia (Gestrickland).

Model of a Salmon Fishery with Weir, at Lottefors in Helsingia (Helsingland).

**ROYAL SWEDISH AGRICULTURAL ACADEMY** (Kongl. Landtbruksakademien) Stockholm.

Model of Wooden Salmon Trap ("Laxkar") from Vermland.

Model of wooden Salmon Trap ("Laxkar") from Munkfors in Vermland.

Model of Salmon Trap from Forshaga in Vermland.

Model of the Salmon Fisheries of Motala Ostrogothia (Östergötland).

Model of wooden Salmon Trap ("Vrakhus"), from Elfkarleby, River Dalelfven.

Model of Salmon Trap ("Laxmjerde"), from Elfkarleby, River Dalelfven.

Model of Netted Salmon Pen ("Lax-gård"), from the mouth of the Ume River.

Model of Salmon Weir with Grates ("Mine"-"Lax-mina"), from Baggböle on the Ume River.

**YAL SWEDISH AGRICULTURAL ACADEMY—** *ontinued.*

Models of wooden Salmon Traps at Klabböle, River Ume.

Exhibit showing the method of setting Nets for Gwyniad and Salmon at Arnemark on the Pite River.
Netted Salmon Pen ("Laxpata"), from the Lule River.

Salmon Pen ("Laxpata"), from the Torne River.
Running Net ("Rännigarn") running on head line, for Salmon Fishing, from Laforsen.
Net for the same purpose ("Draggarn"), from the Salmon Fisheries in Halland.
Net ("Draggarn") for Salmon Fishing, from the Laga River, Halland.

Salmon Net from the River Klarelfven.
Salmon Net from Northbothnia.
Part of a Salmon Net from Kalix.
Part of a Salmon Net from Kalix.
Part of a very coarse Seine ("Kolknot") for Salmon Fishing, from the Torne River.
Trout Nets from Jemtland.
Salmon Net from Bleking.

**IORKILDSÉN, C.,** Sub-Inspector of Fisheries, Karlstadt, Province of Vermland.
Salmon Net used in Lake Venern.
Drift Net for Salmon Fishing used in Lake Venern.

DIVISION XIV.

**lmon rods, reels, lines, artificial flies and baits, gaffs, spears, creels, &c.**

**EIDESDORFF FISHING TACKLE MANUFACTORY (THE)** (Leidesdorffska Fiskredskaps Fabriken) Stockholm.
Gaff Hooks.
Gaff Shears.

DIVISION XV.

**out rods, reels, landing nets, lines, artificial flies, baits, baskets, bags, &c.**

**EIDESDORFF FISHING TACKLE MANUFACTORY (THE)** (Leidesdorffska Fiskredskaps Fabriken) Stockholm.
Trout Rods.
Trout Lines.
Furnished Lines.
Artificial Flies and Baits.

**LIMBORG, H.**, Director of Fisheries for the Province of Sudermania (Södermanland) and Nericia (Nerike).
Otter.

**ROYAL SWEDISH AGRICULTURAL ACADEMY** (Konigl. Landtbruksakademien) Stockholm.
Otter.

## Division XVI.

### Pike, barbel, and other coarse fish rods, reels and tackle artificial spinning baits, &c.

**LEIDESDORFF FISHING TACKLE MANUFACTORY (THE)** (Leidesdorffska Fiskredskaps Fabriken) Stockholm.
Pike Rods peculiar to Sweden.
Perch Rods peculiar to Sweden.
Reels.
Line Winders.
Lines of silk, hemp, and hair, plaited and twisted.
Spoon-Baits.
Spinning Tackle.

**LIMBORG, H.**, Director of Fisheries for the Provinces of Sudermania (Södermanland) and Nericia (Nerike).
Collection of various Rods and Angling Tackle for winter and summer use.

**ROYAL SWEDISH AGRICULTURAL ACADEMY** (Kongl. Landtbruksakademien) Stockholm.
Rush Floats with Roll of Line ("Säfbultor"), for Pike, &c., from Bleking.

## Division XVII.

### Traps, nets, bucks, wheels, and all kinds of apparatus for catching eels, lampreys, &c.

**ANDERSSON, N.**, Sub-Inspector of Fisheries, Åhus, Province of Scania (Skåne).
Net (Tågergarn) for taking Salmon, Pike, &c.

**ANDERSSON, S.**, Manager of the Hammarö Fishing Company, near Karlstad, Province of Vermland.
Burbot Net.
Net for catching Perch and Gwyniad.

**BERGIUS, G.**, Inspector of Fisheries for the Provinces of Gestricia (Gestrikland) and (Helsingland).
Gwyniad Seine.
Lamprey Basket.

**JMKY, A.**, Government Fiscal, Tjernäs, Province of Gestricia (Gestrikland).
Crayfish Pot.

**XECUTIVE COMMITTEE (THE) OF THE ROYAL AGRICULTURAL SOCIETY OF SOUTH WESTROBOTHNIA** (Vesterbottens Läns Kongl. Hushällnings Sällskaps Förvaltningsutskott). Umeå.
Lamprey "Stock,"—A wooden Cylinder for catching Lampreys.

**USTAFSSON, P.**, Fisherman, By, Morshyttan, Province of Dalecarlia (Dalarne).
Trap ("Ryssja") of Brass Wire.
Trap ("Mjärde") of Brass Wire.
Basket of Brass Wire for taking Cray-fish.
Net Sinkers of Clay.

**ANSSON, H.**, Vesterberg, Storvik, Province of Gestricia (Gestrikland).
Model of a Fish Trap ("Katsa") invented by the Exhibitor.

**OLMBERG, P. G.**, Net Maker, Vika kyrkoby, Korsnäs, Province of Dalecarlia (Dalarne).
Long Net.
Pike Perch Net.
Bream Net.
Bag Net.
Bow Nets, Hoop Nets or Weels.
Hand Net for catching Bait.
Seine.
Net Ropes of Horse Hair.

**OLMGREN, C. J.**, Fisherman, Gefle, Province of Gestricia (Gestrikland).
Gwyniad Nets.

**ARSSON, G. W.**, Sub-Inspector of Fisheries, Gässlösa, Ölme, Province of Vermland.
A 48-ft. Net Junket ("Ryssja") used for taking Pike-Perch (Lucioperca) in Lake Venern.
Two Nets for taking Gwyniad in Lake Venern.
Net for taking Pike-Perch in Lake Venern.

**EIDESDORFF FISHING TACKLE MANUFACTORY (THE)** (Leidesdorffska Fiskredskaps Fabriken), represented by the owner, E. Leidesdorff.
Landing Nets, complete.
Mechanical Eel Spears.
Bottom Lines, singly and in boxes.
Nets, unfitted and fitted suitable for every variety of Fresh-water Fishing.

**LIMBORG, H.**, Director of Fisheries in the Provinces of Sudermania (Södermanland) and Nericia (Nerike).

Pike Trap, with funnel-shaped inlet.
Pike Trap, without funnel-shaped inlet.
Double Burbot Trap for Winter Fishing.
Great Three-armed Hoop Net for Spring Fishing.
Burbot Trap (to suspend under the ice) for Winter Fishing.

Double Trap Net for catching Pike-Perch (Spring Season).

Perch Seine, with "gliding Net."
Perch Seine, with Net fastened to the Ropes.
Pike-Perch, and Gwyniad Net, with sliding Netting.

Pike-Perch and Gwyniad Net, with the Net fixed to the Roping.
"Asp" Net with fixed Netting for catching *Aspius rapax*.

"Asp" Net with sliding Netting.
Standing Nets for catching the Baltic Herring.
Trammel for catching Bream.
Bow Net for taking Roach.
Model of Bow Net for taking Bream.
Sweep Net, constructed by the Exhibitor.
Sweep Net.
Model of Hand Net after Mr. Herzmans' model, completely fitted up.
Hand Net for catching Fry for bait.
Model of Splint Trap or Pen ("Spjelkatsa").
Crayfish Baskets or Pots.
Conical Trap for Lampreys ("Nejonögontina").
Model of Eel Trap ("Ålkista").

**LINDBLOM, L.**, Sub-Inspector of Fisheries, Årsunda on the "Gefle-Dala" Railway. Province of Gestricia (Gestrikland).

Net for catching Bream, Pike, Perch, and Roach, Vendace and Bait.
Junkets.
Hoop Net, of Yarn ("Garnmjärde").
Wicker-work Weel ("Videmjärde").

**ROYAL AGRICULTURAL SOCIETY OF THE PROVINCES OF GESTRICIA (GESTRIKLAND) AND HELSINGIA (HELSINGLAND).**

Great Weel or Trap ("Storryssja" for Freshwater Fishing.

Seine ("Spillernot,") with Splints, used in the Province of Gestricia.

**YAL SWEDISH AGRICULTURAL ACADEMY** (onigl. Landtbruksakademien), Stockholm.

Gwyniad Nets of Silk, from Lake Venern
Nets for taking "Fat" Gwyniad and Burbot, from Stora Eken on the coast of Lake Venern.
Gwyniad Nets, from Lake Venern.
Nets for taking Gray Gwyniad, from Lake Venern.

Net for taking Great Gwyniad, from Lake Vettern.

Net for taking Small Gwyniad, from Lake Vettern.

Gwyniad Net, from Lake Vettern.
Vendace Nets, from Lake Vettern.
Gwyniad Nets.
Vendace Net, from Lake Mälarn.
Net for Green Gwyniad from Lake Runn in Dalecarlia.

Gwyniad Nets, from Angermania.
Net, called "Strö," from Lake Vettern.
Bream Net.
Trammel, "Grimgarn" or "Skottnät."
Perch Net.
Perch Net, from Helsingland.
Perch and Gwyniad Net, from Stensele, in the Lycksele district of Lapland.
Hoop or Bow Nets of Yarn ("Garnmjärdar") for the Fresh-water Fisheries.
Hoop Net for Burbot ("Lakeryssja"), from Lake Mälarn.

Lamprey-Weel, from Northbothnia (Norrbotten).
Lamprey-Weel, from Elfkarleby.
Lamprey-Weel or Cone, from the Ume River.
Two Weels with small Meshes.
Three Eel and three Pike-Leisters, from the Province of Bleking.
Pike Weel, from the Province of Bleking.
Roach Weel, from the Province of Bleking.

Pike Seine, from the Province of Bleking.
Long Line for Eel and Perch, from the Province of Bleking.

Wicker Basket for Eel, from the Province of Bleking.

Sink Net (Hand Net for deep-sea use).
Stave or Set Net, from the Province of Bleking.
Pike Net, from the Province of Bleking.
Gwyniad Net, from the Province of Bleking.
Roach Net, from the Province of Bleking.
Blay Net, from the Province of Bleking.

**THORKILDSÉN, C.**, Sub-Inspector of Fisheries, Ka
Province of Vermland.
Pike Net, from Lake Venern.
Net for taking Perch and Gwyniad in Lake Venern.

Net Junket ("Garnmjärde").

**WALLNER, O.**, Hudiksvall, Province of Helsingia (Helsing
Burbot Traps.

DIVISION XVIII.

**Hooks, &c.**

**LARSSON, G. W.**, Sub-Inspector of Fisheries, Gässlösa,
Province of Vermland.
Collection of Hooks for Freshwater Fishing.

**LEIDESDORFF (THE) FISHING TACKLE MA FACTORY** (Leidesdorffska Fiskredskaps Fabriken), repres by the owner, E. Leidesdorff, Stockholm.
Hooks, singly, and with Snoods.

**LIMBORG, H.**, Director of Fisheries in the Provinces of Sa mania (Södermanland) and Nericia (Nerike).
Angling Hook.
Rod and Reel Hook.
Long Line with case for different Fish.
Long Line for Pike, &c.

**ROYAL SWEDISH AGRICULTURAL ACADE** Stockholm.
Grapnel-shaped implement, called Lakekäx, consisting of Hooks, radiating from a Shank, used for catching Burb Lake Vettern.

DIVISION XX.

**Boats, punts, cobles, collapsible, portable, &c., in models or otherwise.**

**POUSARD, P.**, Keeper of the Lighthouse at Saltvick-p Hudiksvall, Province of Helsingia (Helsingland).
Model of Boat for Freshwater Fishing, with Gear.

**ROYAL SWEDISH AGRICULTURAL ACADE** (Kongl. Landtbruksakademien), Stockholm.
Model of a Punt ("Drageka") used at the Salmon Fish in the River Laga, Halland.
Model of Fishing Punt from Lake Mälarn.
Boats from Lake Vettern.
Boat from Hammarö on Lake Venern.
Boat from Lake Siljan Dalecarlia.
Salmon Fishing Boat from the Ume River.

## CLASS II.

## ECONOMIC CONDITION OF FISHERMEN.

### DIVISION XXI.

**Apparel and personal equipment.**

**ISTIANSSON, C. J.**, Merchant, Olofsholm, Malmön, rince of Bohus (Bohuslän).
isherman's Outfit.

**CUTIVE COMMITTEE (THE) OF ROYAL RICULTURAL SOCIETY OF SOUTH WESTRO-THNIA** (Vesterbottens Läns Kongl. Hushållnings Sällskaps raltnings Utskott), Umeå.
utfit of Sealhunter.

**MBERG, P. G.**, Net Maker, Vika kyrkoby, Korsnas, rince of Dalecarlia (Dalarne).
ammock.

**RG, S.**, Fisherman, Borstahusen, Landskrona, Province of ıia (Skåne).
isherman's Outfit, consisting of Trowsers and Jacket with Hood of tarred seal-skin, oil-cloth Southwester, and very high waterproof Boots.

**ION, BOSE M.**, Fisherman, Råå, Raus, Province of Scania ine).
ishing Boots.

**LOGICAL DEPARTMENT OF ROYAL MUSEUM NATURAL HISTORY** (Naturhistoriska Riksmuseum), kholm.
thnographical objects.

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## CLASS III.

## COMMERCIAL AND ECONOMIC.

### DIVISION XXVI.

**dried, smoked, cured, salted, tinned, or otherwise prepared for food.**

**ISON, G. P.**, Merchant, Otterbäcken, Province of Westro-ıia (Vestergötland).
resh Salmon in ice.
noked Salmon, whole sides.
ightly salted Salmon ("Graflax").

**AHNSTRÖM**, Curer, Marstrand, Province of Bohus (Boh
Bohus Herring.

**ANDERSSON, A. & Co.**, Curers, Merchants, Goth
(Göteborg).
Herring and other kinds of Fish.

**ANDERSSON**, Fisherman, Mälarn, forwarded by L
Fishery Director.
Fresh Fish in ice.

**ANDERSSON, GÄCK. J.**, Fisherman, Rå, Raus, Prov
Scania (Skåne).
Salted and pressed Cod (Klippfisk).
Dried Fish of different kinds (flounder, plaice, &c.).

**ANDERSSON, G.**, Merchant, Tjellbacka, Province of
(Bohuslän).
Swedish Anchovies (pickled sprats).
Swedish Sardines (sprats in oil).
Bohus Herring.

**ANDERSSON, N.**, Sub-Inspector of Fisheries, Åhus, P
of Scania (Skåne).
Preserved Eels.

**ANDERSSON, S.**, Manager of the Hammarö Fishing Co
Karlstad, Province of Vermland.
Fresh Salmon in Ice.

**ARESCHOUG, O.**, Landed Proprietor, Esperöd, Kivik, P
of Scania (Skåne).
Salted Eels.

**BEIJER, H.**, Sub-Inspector of Fisheries, Grafvarne, Prov
Bohus (Bohuslän).
Bohus Herring.
Pickled Herring.

**BERG**, Fisherman, Mälarn, forwarded by Limborg, F
Director.
Fresh Fish in ice.

**BERGIUS, G.**, Inspector of Fisheries for the Provinces
tricia (Gestrikland) and Helsingia (Helsingland).
Salted Herrings from the Baltic ("Strömming") caug
drift nets off the coast of Gefle.
Herrings from the Baltic ("Strömming"), salted accor
the method used in Gotland.

**BERGSTRÖM, H. C.**, Merchant, Lysekil, Province of
(Bohuslän).
Finest Swedish-potted "Delicate Anchovies."
Delicate Herrings, skin- and bone-less.
Swedish Sardines (sprats in oil).

**BERGSTRÖM, H. F.**, Member of the Second Chamber of the Swedish Parliament, Lulcå, Province of Westrobothnia (Vesterbotten).
Fresh Salmon in ice.

**CARLSSON**, Fisherman, Mälarn, forwarded by Limborg, Fishery Director.
Fresh Fish in ice.

**CARLSSON, F.**, Merchant and Manufacturer, Lyckil, Province of Bohus (Bohuslän).
Swedish Anchovies.
Skin- and bone-less Herrings, tinned.
Bohus Herrings.
Bohus "Fat" Herrings.

**CHRISTIANSSON, C. J.**, Merchant, Olofsholm, Malmön, Province of Bohus (Bohuslän).
Swedish Anchovies (pickled sprats).
Mackerel, preserved in ice.
Laberdan.
Dried or Split Ling ("Spillånga") for preparing "Lutfisk," which is eaten after having been soaked in lye (lut).

Salted Bohus Herrings.

**CHRISTIANSSON, O.**, Merchant and Saltery Owner, Olofsholm, Malmön, Province of Bohus (Bohuslän).
Salted and dried Ling ("Långekabiljo").
Salted and dried Cod ("Torskabiljo").
Dried Ling ("Spillånga") for soaking in lye.
Swedish Anchovy, tinned.
Bohus Herrings.

**CORNELIUSSON**, — Merchant, Hafstensund, Province of Bohus (Bohuslän).
Bohus Herrings.
Salted Fish of various kinds.

**DAHLGREN, A.**, Civil Engineer, Karlstad, Province of Vermland.
Preserved Salmon, "Patent Salmon" in hermetically closed tin boxes.

**DANELIUS, B. A.**, Merchant, Stockholm.
Salmon in ice.

**ÖSTRÖM, T. S.**, Curer, Möllösund, Province of Bohus (Bohuslän).
Products from the bank fisheries in the North Sea.

**ERICSON, N. O.**, Merchant, Lysekil, Province of Bohus (Bohuslän).
Swedish Superior Anchovies ("Delicate").
Herring, skin- and bone-less, superior quality.
Salted Ling.
Salted Cod.
Split Ling.
Salted Herrings.

**EXECUTIVE COMMITTEE (THE) OF THE ROYAL AGRICULTURAL SOCIETY OF SOUTHWESTRO-BOTHNIA** (Vesterbottens, Läns Kongl. Hushållnings Sällskaps Förvaltnings Utskott, Umcå).
Salted Gwyniad.
Salted Herrings from the Baltic ("Strömming").

**GERMAN FISH CURING WORKS (THE)** (Tyska Rökeriet), Gothenburg (Göteborg).
Smoked Bohus Herrings.
Fresh Fish in ice.

**GIÖBEL, A.**, Civil Engineer, Hammar and Bastedalen, Province of Nericia (Nerike).
Fresh Fish in ice.

**GJÖTBERG, O.**, Innkeeper, Lysekil, Province of Bohus (Bohuslän).
Swedish Anchovies.

**GOTTLANDER, H.**, Curer and Merchant, Klädesholmen Province of Bohus (Bohuslän).
Split Ling ("Spillånga").
Dried Cod.
Salted Ling.
Salted and dried Cod (Cabliau).
Laberdan.
Bohus Herrings.

**HAGBERG, A.**, Merchant, Grundsund, Province of Bohus (Bohuslän).
Swedish Anchovies.
Skin- and bone-less Herrings.
Cod, salted and dried (Cabliau).
Split Ling ("Spillånga").
Bohus Herrings.

**HALLAND SALMON FISHING COMPANY (THE)**, per agency of Th. Simmingskiöld, Gothenburg (Göteborg), and P. Svenonius Laholm.
Fresh Salmon in ice.
Smoked Salmon.

**LLGREN, T. T.**, Merchant, Gullholmen, Gothenburg (Göteorg).
Swedish Anchovies, with and without bones, in pickle and in oil, tinned.
Bohus Herrings.

**SSELGREN, C.**, Merchant, Uddevalla, Province of Bohus (Bohuslän).
Bohus Herrings.

**DBERG, J. E.**, Ship's Master, Lysekil, Province of Bohus Bohuslän).
Different kinds of preserved fish.

**LLSTRÖM, E.**, Fisherman, Hudiksvall, Province of Helsingia Helsingland).
Salted Herrings from the Baltic.

**NRICKSSON, A.**, Fisherman, Borstahusen, Landskrona, Province of Scania (Skåne).
Dried fish of different kinds.

**ORTSBERG, C. W.**, Tenant of the Salmon Fishery at Edsfors in the Lule River, Svartlå, Boden, Province of Westrobothnia (Norrbottens Län).
Fresh Salmon in ice.

**OLMERTZ, N.**, Tenant of the Salmon Fishery (belonging to the Crown) of Motala in the Province of Ostrogothia (Östergötland).
Fresh Fish in ice.

**KANSSON, A.**, Fisherman and Sub-Inspector of Fisheries, Knäbäck, Maglehem, Province of Scania (Skåne).
Salted Eels.

**PPSSON, L.**, Fisherman, Baskemölle, Simrishamn, Province of Scania (Skåne).
Dried Sand Eels.

**NSSON, N.**, Fisherman, Limhamn, Malmö, Province of Scania (Skåne).
Salted Herrings from Öresund.

**AHL, G. W.**, Custom House Officer, Råå, Raus, Province of Scania (Skåne).
Salted Öresund Herrings.

**JELLBERG, S.**, Merchant, Lysekil, Province of Bohus (Bohuslän).
Swedish Anchovies, in tins.
Herrings, skin- and bone-less, in tins.

**RUSELL, C. A.**, Curer and Merchant, Klädesholmen, Province of Bohus (Bohuslän).
Split Ling ("Spillånga").
Dried Cod.

**KRUSELL, C. A.**—*continued.*
Salted Ling.
Cod, salted and dried ("Cabliau").
Laberdan.
Bohus Herrings.

**KÄLLVIKEN CURING AND FISH-OIL FACTORY (THE)** (Källvikens Salteri och Olje Fabrik), Uddevalla, Province of Bohus (Bohuslän).
Bohus Herrings.

**LARSEN, O., & SKÄRSTRÖM, J.**, Curers, Strömstad, Province of Bohus (Bohuslän).
Salted Bohus Herrings.

**LARSSON, A.**, Fisherman, Råå, Raus, Province of Scania (Skåne).
Smoked Eels.
Salted Cod.

**LARSSON, —** Fisherman, Vrena, Province of Sudermania (Södermanland), forwarded by Limborg, Fishery Director.
Fresh Fish in ice.

**LARSSON, C.**, Fisherman, Kråkvik, Valdemarsvik, Province of Ostrogothia (Östergötland).
Swedish Anchovies (pickled sprats), potted.

**LARSSON, G. W.**, Sub-Inspector of Fisheries, Gässlösa, Ölme, Province of Vermland.
Salted "Fat" Gwyniad from Lake Venern.

**LE VEAU, J.**, Custom House Coast Guard, Mölle, Province of Scania (Skåne).
Salted Herrings from Kullen.
Pickled Herrings from Kullen.

**LJUSNE IRON WORKS (THE)** (Ljusne Järnverk), Province of Helsingia (Helsingland).
Fresh Salmon from Ljusne, in ice.
Salted Salmon from Ljusne.

**LUNDGREN, P. W.**, Civil Engineer, Stockholm.
Herrings from the Baltic ("Strömming") prepared as Sardines.
Trout in oil.
Marinated Sprats.

**LYSELL, A.**, Merchant, Lysekil, Province of Bohus (Bohuslän).
Swedish Anchovies (pickled sprat).
Herrings, preserved, with skin and bones removed ("Delicate Herring").
Salted Herrings from Bohus.

**ACFIE, A.**, Herring Curing Company, Uddevalla, Province of Bohus (Bohuslän).
Bohus Herrings.

**ARSTRAND CURING COMPANY (THE)** (Marstrands Salteri aktiebolag) Province of Bohus (Bohuslän).
Bohus Herrings.

**OLLÉN, B. & Co.**, Lysekil, Province of Bohus (Bohuslän).
Swedish Anchovies.
Skin- and bone-less Herrings.

**ILSSON, E.**, Merchant, Grebbestad, Province of Bohus (Bohuslän).
Salted Bohus Herrings.
Preserved Mackerel and Sprat.
Pickled Bohus Herrings.

**ILSSON. E.**, Curer, Grafvarne, Province of Bohus (Bohuslän)
Salted Fish from the fisheries on the North Sea Ocean Banks.

Salted Bohus Herrings.

**LSSON**, Fisherman, Lake Båfven, forwarded by Limborg, Fishery Director.
Fresh Fish in ice.

**LSSON, S.**, Fisherman, Råå, Raus, Province of Scania (Skåne).
Salted Öresund Herrings.

**ETTERSON**, Fisherman, Nynäs, Province of Sudermania (Södermanland), forwarded by Limborg, Fishery Director.
Fresh Fish in ice.

**EHNMARK O. A.**, Merchant, Umeå, Province of Westrobothnia (Vesterbotten).
Smoked Eels.
Smoked Herrings ("Böckling").
Cured Salmon.
Swedish Anchovies.
Cooked and tinned Salmon.
Cooked and tinned Eels.
Cooked and tinned Pike.
Cooked and tinned Gwyniad.
Cooked and tinned Perch.
Cooked and tinned Pike-Perch.
Cooked and tinned Bream.

**UTBERG, J.**, (late Major), Saltery owner, Töre, Gammalgård, Province of Northbothnia (Norrbotten).
Salmon, head- and bone-less, salted when cold.

**JHELIN**, Fisherman, Hornsund, Province of Sudermania (Södermanland) forwarded by Limborg, Fishery Direc
Fresh Fish in ice.

**SUNDBERG, G. T.**, Merchant, Vice-Consul, Lysekil, Province of Bohus (Bohuslän).
Swedish Anchovies.
Herrings, skin- and bone-less ("Delicate Herring").
Salted Bohus Herrings.

**SVENSSON, N.**, Fisherman, Borstahusen, Landskrona, Province of Scania (Skåne).
Dried Fish (cod, plaice, flounders, &c.).
Salted Herrings from Öresund.
Pickled Herrings.

**SYLVANDER, J.**, Merchant, Curer, Strömstad, Province of Bohus (Bohuslän).
Salted Bohus Herrings.

**THORBURN, W. E.**, Merchant, Uddevalla, Province of Bohus (Bohuslän).
Bohus Herrings.

**THORKILDSEN, C.**, Sub-Inspector of Fisheries, Karlstad. Province or Vermsland.
Salted "Fat" Gwyniad, from Lake Venern.

**TWO FISHERMEN**, from Vinön, Lake Hjelmaren, Province of Sudermania (Södermanland), reported by Limborg, Fishery Director.
Fresh Fish in ice.

**WALLIN, J.**, Merchant, Lysekil, Province of Bohus (Bohuslän).
Swedish Anchovies.
"Delicate" Herrings, skin- and bone-less.
Bohus Herrings.
Pickled Herrings.

**WELLMAN, J.**, Curer, Ystad, Provinceb
Cured Herrings in tin boxes (cured

**WESTEGREN, C.**, Vice-Consul, Haparanda, Province of Westrobothnia (Vesterbotten).
Fresh Salmon in ice.

## Division XXVII.

### All products prepared from fish, such as oils, roes, isinglass, &c.

**BEIJER, H.**, Sub-inspector of Fisheries, Grafvarne, Province of Bohus (Bohuslän).
Sounds or Swimming-bladders of Fishes ("Fisksunn") from which Isinglass and Gelatine are prepared.

**ARLSON, F.**, Merchant and Manufacturer, Lysekil, Province of Bohus (Bohuslän).
Isinglass.
Cod and Ling Sounds.
Fish Sounds prepared for clarifying coffee.

**HRISTIANSSON, C. J.**, Merchant, Olofsholm, Malmön, Province of Bohus (Bohuslän).
"Kaffeklaring," material for clarifying coffee.

**HRISTIANSSON, O.**, Merchant, Olofsholm, Malmön, Province of Bohus (Bohuslän).
"Kaffeklaring" material for clarifying coffee, cut, in boxes and packets.
"Kaffeklaring," material for clarifying coffee, uncut, whole.

**JÖTBERG, O.**, Innkeeper, Lysekil, Province of Bohus (Bohuslän).
Caviare of Cod Roe.

**OTTLANDER, H.**, Curer and Merchant, Klädesholmen, Province of Bohus (Bohuslän).
Salted Cod Roe (Sardine bait).

**JELLBERG, S.**, Merchant, Lysekil, Province of Bohus (Bohuslän).
Cod Caviare, in glass and tin cases.

**AGBERG, S. A.**, Merchant, Gothenburg (Göteborg).
Products prepared from Fish, of different kinds

**RUSELL, C. A.**, Curer, Merchant, Klädesholmen, Province of Bohus (Bohuslän).
Salted Cod Roe (Sardine bait).

**ILSSON, E.**, Curer, Grafvarne, Province of Bohus (Bohuslän).
Fresh Caviare.

**EHNMARK, O. R.**, Merchant, Umeå, Province of Westrobothnia (Vesterbotten).
Umeå Caviare, after the Russian method.
Gwyniad Roe (preserved as Caviare).
Vendace Roe (preserved as Caviare).
Burbot Roe (preserved as Caviare).

**AHLSTRÖM & Co.**, represented by H. Sandeberg, Lieutenant R.E., Stockholm.
Fish Extract.
Isinglass.
Glue.
Oil.

## Division XXIX.

### Oils, manures, and other products prepared from fish.

**ANGLO-SWEDISH COMPANY, (THE) Limited,** 23 Old Change, London, E.C., änd Lysekil, Province of Bohus (Bohuslän).
Fish Guano.
Superphosphates from Fish Guano.
Oils.

**"ARCTIC OCEAN" COMPANY, (THE)** Aktiebolaget Ishafvet Gothenburg (Göteborg).
Seal Oil.

**FISH PRODUCTS COMPANY (THE)** (Fisk-Produkt Aktielaget) Gothenburg (Göteborg).
Fish Oil, Guano, &c.

**HAGBERG, P. A.,** Merchant, Grundsund, Province of Bohus (Bohuslän).
Various Fish Products.

**KÄLLVIKEN CURING AND FISH-OIL WORKS (THE)** (Källvikens Salteri och Oljefabrik) Uddevalla, Province of Bohus (Bohuslän).
Herring Oil.
Guano.

**SAHLSTRÖM & Co.,** represented by H. Sandeberg, Lieutenant R.E., Stockholm.
Guano.
Albumen.

## Division XXXII.

### Preparation and application of sponges, corals, pearls, shells, and all parts and products of aquatic animals, &c., to purposes useful and ornamental, with specimens.

**AXELSSON, G., Miss,** Norrköping, Province of Ostrogothia (Östergötland).
Flowers of Fish-scales.

**HAGBERG, E., Mrs.,** Grundsund, Province of Bohus (Bohuslän).
Ornamental Fancy Articles of Fish-scales.

**HEDIN, H., Miss,** Krognäs, Nyköping, Province of Sudermania (Södermanland).
Flowers of Fish-scales.

**LEMBKE, F., Miss,** Ystad, Province of Scania (Skåne).
Ornamental Fancy Articles of Fish-scales.

**NOMELL, E., Mrs.,** Gothenburg (Göteborg).
Fancy Articles, made of Lobster, shells, &c.

DIVISION XXXIII.

**ces for carrying fish and for preserving fish during nsport or otherwise, and models of the same.**

**SSON, GÄCK, J.**, Fisherman, Råå, Raus, Province of (Skåne).
ttfat" Apparatus for keeping Prawns.
e Well or Cistern for keeping Cod alive.

**R, F. L.**, Vice-Consul, Manufacturer, Uddevalla, Province ıs (Bohuslän).
ıine-made Barrels of different kinds.

**ON, C.**, Fisherman, Kråkvik, Valdemarsvik, Province of ›thia (Östergötland).
ıl of Boat with Well.

**N, J.**, Fisherman, Råå, Raus, Province of Scania (Skåne).
for Storing Live Fish.

**SWEDISH AGRICULTURAL ACADEMY** (Kongl. ruksakademien), Stockholm.
ng Boat with Well, from the coast of Stockholm.

ng Boat with Well, from the Coast of Stockholm.

**RG & ANDERSSON**, Gothenburg (Göteborg), of the Foglavik Glassworks in Westrogothia (Vesterland).
es with Patent Stoppers.

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CLASS IV.

FISH CULTURE.

DIVISION XXXV.

**s or drawings of fish-hatching, breeding and establishments, including oyster and other shellnds; and all apparatus and implements connected e same and for transporting fish and fish ova. · fry.**

**VIST, H.**, Schoolmaster, Hille, Gefle, Province of ia (Gestrikland).
ıl of Hatching Basket, named after its inventor, Orstadius.

**ERIKSSON, N. T.**, Manager of Mines, Långnäs, Tjernäs, Province of Gestricia (Gestrikland).
Plan of a Piscicultural Establishment at Långnäs, for fish spawning in spring.

**LIMBORG, H.**, Director of Fisheries for the Province of Sudermania (Södermanland) and Nericia (Nerike).
Well for Cray-fish culture.

**LINDBLOM, L.**, Sub-Inspector of Fisheries, Årsunda, Gefle-Dala Railway, Province of Gestricia (Gestrikland).
Drawings and sketches.

**PETTERSON, P.**, Sub-Inspector of Fisheries, Uddnäs, Korsnäs, Province of Dalecarlia (Dalarne).
Case for transporting spawning fish, for artificial fecundation.

**ROYAL AGRICULTURAL SOCIETY OF GESTRICIA (GESTRIKLAND AND (HELSINGIA) HELSINGLAND.**
Small apparatus for hatching Salmon.
Hatching Cauf for fish spawning in spring, one-third of natural size.
Californian Hatching Case.
Hatching Case (Seth Green's system) for fish spawning in spring.

**ROYAL SWEDISH AGRICULTURAL ACADEMY** (Kongl. Landtbruksakademien) Stockholm.
Model of Piscicultural Establishment (for Salmon) at Piparböle in Westrobothnia (Vesterbotten).
Model of Piscicultural Establishment (for Salmon) at Hofsmölla in Halland.
Model of Lund's Hatching Cauf for fish spawning in spring.

**WÅHLÉN, TH.**, Manager of Årås, Vermlands Säby, Province of Vermland.
Model of Piscicultural Establishment at Årås, Vermland.

## Division XXXVII.

### Models and drawings of fish passes and fish ladders. Scientific Investigation.

**YHLEN, v. G.**, Inspector of Fisheries, Lysekil, Province of Bohus (Bohuslän).
Plan of a projected Salmon Pass in the Falls of "Trollhättan."

DIVISION XL.

**'hysico-chemical investigation into those qualities of t and fresh water which affect aquatic animals; investi-ion of the bottom of the sea and of lakes, shown by nples; aquatic plants in relation to fishing, &c.; re-rches into the aquatic fauna (animals of the several sses preserved in alcohol or prepared, &c.); apparatus i implements used in such researches.**

**WIDSSON, TH.**, Commander R.S.N., Chief Officer, Royal Hydrographical Office, Stockholm.
Hydrographical Instruments.

**MAN, F. L.**, Professor, Stockholm.
Hydrographical Instruments.

**YBOM, F.**, Dr. Ph., Assistant of Fisheries, Lund, Province of cania (Skåne).
Bottom Samples from Swedish Lakes.

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CLASS V.

NATURAL HISTORY.

[AQUARIA.]

DIVISION XLII.

**ecimens living (marine and fresh water), fresh, stuffed r preserved, casts, drawings, and representations of—**

**) Algæ to be arranged under genera and species with localities appended.**

**ELLMAN, F. R.**, Dr. Ph., Docente at the University of Upsala, rovince of Upland.
A Collection of Marine Algæ from the western coast of Sweden, collected in the winter months.

**TTROCK, V. B.**, Professor, Stockholm and Nordstedt, C. F. O. r. Ph., Lund, Province of Scania (Skåne).
Algæ aquæ dulcis exsiccatæ; Fasciculi 1–10.

DIVISION XLVI.

**(b) Mollusca of all kinds and shells not included in Class III.**

**JKSON, OSCAR**, Gothenburg (Göteborg).
Lower Marine Animals from Sweden.

**MALM, A. H.**, Dr. Ph., Gothenburg (Göteborg).
Collection of Marine Shells peculiar to the Bohus Coast (W. Sweden).

**NORDENSKIÖLD, A. E.**, Baron, Professor, Stockholm.
Mollusca of all the kinds collected by the Vega Expedition.

## Division XLVII.

(c) Starfishes, sea urchins, holothuriæ.

**NORDENSKIÖLD, A. E.**, Baron, Professor, Stockholm.
Starfish, Sea Urchins and Holothuriæ, from the Vega Expedition.

## Division XLVIII.

(d) Worms used for bait, or noxious; leeches, &c.

**DICKSON, OSCAR**, Gothenburg (Göteborg).
Lower Freshwater Animals from Sweden.

**NORDENSKIÖLD, A. E.**, Baron, Professor, Stockholm.
Worms from the Vega Expedition.

**TRYBOM, F.**, Dr. Ph., Assistant of Fisheries, Lund, Province of Scania (Skåne).
Bait used along the Scanian Coasts. (Collection of Animal Bait and baited Hooks, showing manner of using them on this Coast.)

## Division L.

(*f*) Crustacea of all kinds.

**ILLJEBORG, W.**, Emeritus Professor University of Upsala.
A series of Swedish freshwater Crustacea.

**ORDENSKIÖLD, A. E.**, Baron, Professor, Stockholm.
Crustacea of all the kinds collected by the Vega Expedition.

**RYBOM, F.**, Dr. Ph., Assistant of Fisheries, Lund, Province of Scania (Skåne).
Commonest Swedish freshwater Crustacea serving as food for fish. (Collection in spirits.)
Food for Herring on the coast of Bohus, during the winter 1880–1881. (Collection in spirits.)

## Division LI.

(*g*) Fish of all kinds.

**ICKSON, OSCAR,** Gothenburg (Göteborg).
Stages of development of fishes.
Clupeidæ (Herrings) from the Cattegat and other Scandinavian Fishing Grounds, and from the northern part of the Atlantic, at various seasons of the year and of various ages.

**IMBORG, H.**, Director of Fisheries for the Provinces of Sudermania (Södermanland) and Nericia (Nerike).
Collection of Spawn.

**ALM, A. H.**, Dr. Ph., Gothenburg (Göteborg).
Head of Cod-fish, skeleton prepared by Exhibitor.

**ORDENSKIÖLD, A. E.**, Baron, Professor, Stockholm.
Arctic Fish of all kinds, from the Vega Expedition.

**OOLOGICAL DEPARTMENT OF ROYAL MUSEUM OF NATURAL HISTORY** (Naturhistoriska Riksmuseum), Stockholm.
Scandinavian Fishes.

## Division LIII.

(*h*) Aquatic and other birds hostile to fish or fishing.

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### Division LIV.

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Whales.
Seals.

### Division LV.

**Works on ichthyology. Maps illustrating geographical distribution, migration, &c., of fishes and spawn.**

**LINDQVIST, J.,** Author, Norrköping, Province of Ostrogothia (Östergötland).
Fishes, their importance in the history of Culture and in National Economy. (Fiskarne i Kulturhistorien och Nationalekonomien).

**THORKILDSÉN, C.,** Sub-Inspector of Fisheries, Karlstad, Province of Vermland.
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**YHLEN, v. G.,** Inspector of Fisheries, Lysekil, Province of Bohus (Bohuslän).
Chart of Herring Fisheries, 1877–1883.
Chart of the Trawling Grounds of Cattegat.
Publications and Maps concerning the Sea Fisheries.

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## Class VI.

## HISTORY AND LITERATURE OF FISHING—FISHERY LAWS—FISH COMMERCE.

### Division LVIII.

**Fishery laws of different countries.**

**FISHERY COMMITTEE OF THE PROVINCE OF VERMLAND** (Vermlands Fiskeritsyrelse).
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'HORKILDSÉN, C., Sub-Inspector of Fisheries of Karlstad, Province of Vermland.
Fishery Regulations of the Province of Vermland.

DIVISION LX.

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ERGIUS, G., Inspector of Fisheries for the Provinces of Gestricia (Gestrikland) and Helsingia (Helsingland).
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ISHERY COMMITTEE OF VERMLAND (Vermlands Fiskeristyrelse).
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UNDGREN, W. T., Merchant and British Vice-Consul Ström stad, Province of Bohus (Bohuslän).
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ALM, A. H., Dr. Ph., Gothenburg (Göteborg).
Table showing when Fish for the Gothenburg market is in season.

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HORKILDSÉN, C., Sub-Inspector of Fisheries, Karlstad, Province of Vermland.
Statistics of the Fishery District of Western Vermland.

ILEN, v. G., Inspector of Fisheries of the Province of Bohus (Bohuslän) Lysekil.
Reports on the Fisheries of the Province of Bohus, 1866–1881.
The Sea Fisheries of Sweden, Stockholm, 1880. "Die See Fischereien Schwedens," Stockholm, 1880.
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# SWITZERLAND.

SWITZERLAND, with a surface extent of 41,346·5 square kilomètres, has 2[illegible] kilomètres of running water (rivers and streams), occupying a space of [illegible] square kilomètres, the lake expanse amounts to 1342 square kilomètres, so th[illegible] the total extent of Swiss waters is 1573 square kilomètres.

In these there are found forty-six or forty-eight species of fish, it b[illegible] questionable, however, whether some of them are distinct species or m[illegible] varieties.

The Confederation regulates the whole Fishery Industry through the Feder[illegible] Council. The administration is assigned to the Forest Section of the Tra[illegible] and Agricultural Department.

The Federal Law on the Fishery Industry is dated 18th September, 187[illegible] the Council Decree concerning it dates 18th March, 1877.

The execution of the law is left as far as possible in the hands of the different Cantons: some of which are besides charged, by sanction of the Federal Council, with the regulation of the fisheries in boundary waters.

The following Conventions, relating to these last-named fisheries, have been concluded with—

1. Baden and Alsace-Lorraine, dated 14th July, 1877.
2. France, dated 28th December, 1880.
3. Italy, dated 15th September, 1880.

In most of the Cantons the Fishery Industry is under the administration of the Police or Revenue Departments, the police inspection being exercised through the usual channels.

For the boundary-waters on the French frontier the Swiss Convention has appointed two Fishery Commissioners, and the Cantons of Berne and Neuchatel have appointed a similar official for the inspection of the Doubs.

For the preservation and collection of spawn and young fry during the breeding season the different Cantons appoint fishery agents.

There are at present seven fishery wards in Switzerland, one near the town of Zurich, three in the Canton of Berne (belonging to the Aar, the Emme, and the Romder), one in the territory of the Canton of Zug, and two in the Upper Engadine, Canton Grisons. As the last named are contiguous, there are in reality only six of such wards. For the restoration of free passage to fish in certain streams three fish-ladders have been erected, one in the Saone near Freiburg cut into the sandstone, one in the town of Lucerne, and one in the Looze near Cham; the two last being made of wood.

A report on the subject of water-pollution to the injury of fish, so far as concerns the Basle Industrial District, in the first place, will shortly be prepared and circulated.

In the year 1881–82 there were in Switzerland thirty fish-hatching establishments, and from them issued 3,700,000 fish, principally trout, salmon, salmon-trout, and "röthel." The Confederation awards grants to the amount

ncs to these establishments. A small quantity of foreign fish has up ient been acquired by these institutions, among them being *Coregonus B, C. albula L, C. albus, Salmo Guinnat S. fontinalis*, and the land-mon.

jor portion of fishing in Switzerland is a royalty of the cantons, y so in the cantons of Vaud, Vallais, Neuchatel, Oberwalden, Glarus, nzell, also in Rhoden, and, with few exceptions, in the Cantons of risons, Solothurn, and Freiburg. Private fishing rights exist princi-ie Cantons of Berne, Aargau, and Ticino,

s a Central Fishermen's Benefit Society, and four local societies (one iton of Basle, two in Grisons, and one in Berne).

owing table shows the total Imports and Exports in the years 1881 respectively:—

| | Imports. | | Exports. | |
|---|---|---|---|---|
| | 1881. | 1882. | 1881. | 1882. |
| | Kilos. | Kilos. | Kilos. | Kilos. |
| repared, in packages, r 5 kilogrammes . . | 1,424 | 1,391 | 153 | 23 |
| ish . . . . . | 14,715 | 14,752 | 48 | 120 |
| ried smoked or salted, ackages of 5 kg. and :— | | | | |
| ock-fish . . . . . | 1,449 | 1,286 | 20 | 9 |
| errings . . . . . | 746 | 759 | 1 | 9 |
| her fish. . . . . | 932 | 1,027 | 88 | 71 |
| Total . . . | 19,266 | 19,215 | 310 | 232 |

*the time of going to press with the First Edition the List of Exhibits for Switzerland had not been received.*]

# VENEZUELA.

THE Venezuelan Consul in London furnishes the following information rel to the state of the fishing industry in that Republic:—

There are no restraints upon the fishing industry in Venezuela, the frontage being so immense that there is abundance of fish for every one chooses to secure it, and all are equally free to do so.

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No statistics are kept on the subject, the supply being unlimited, governed only by the demand.

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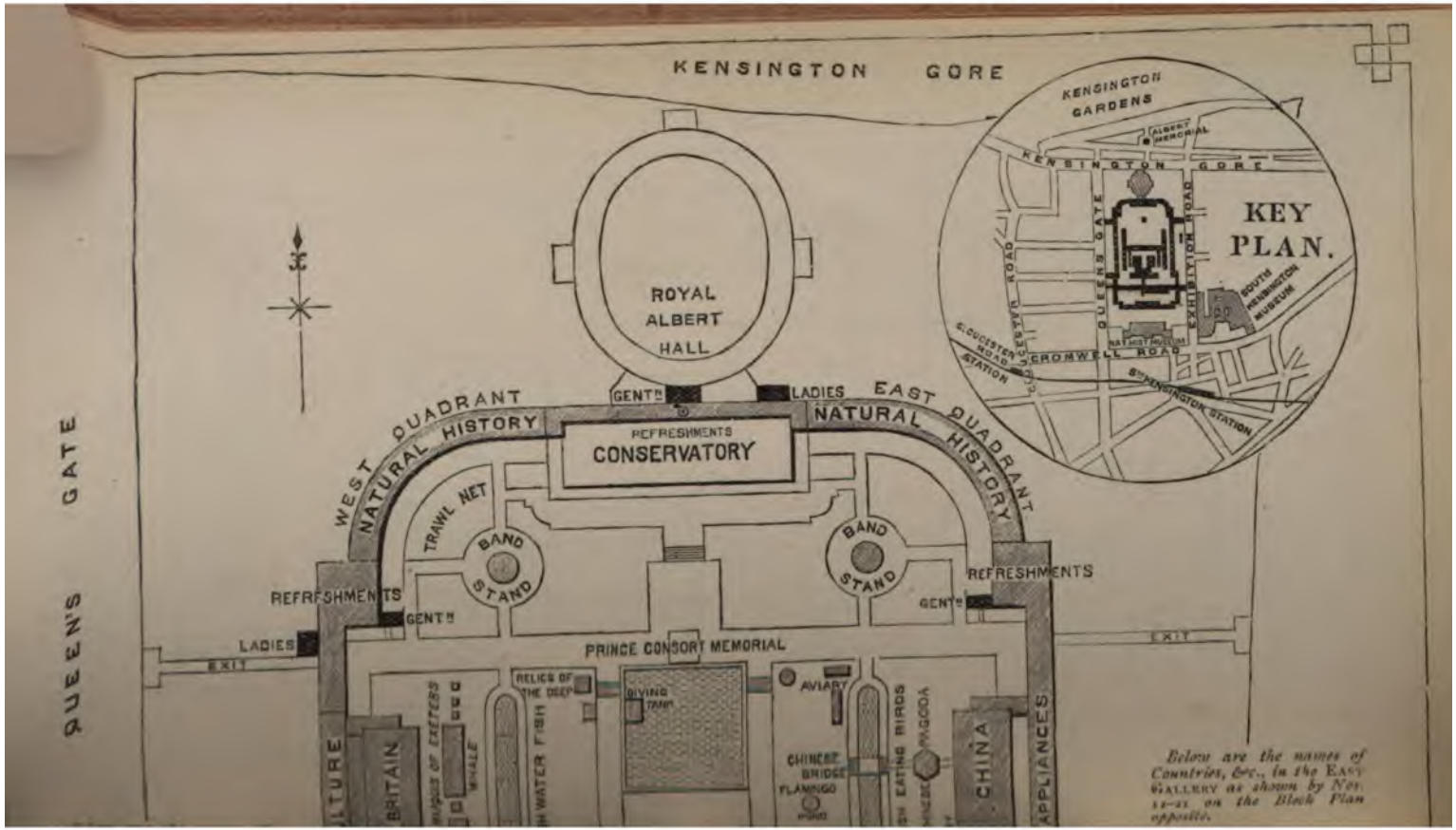
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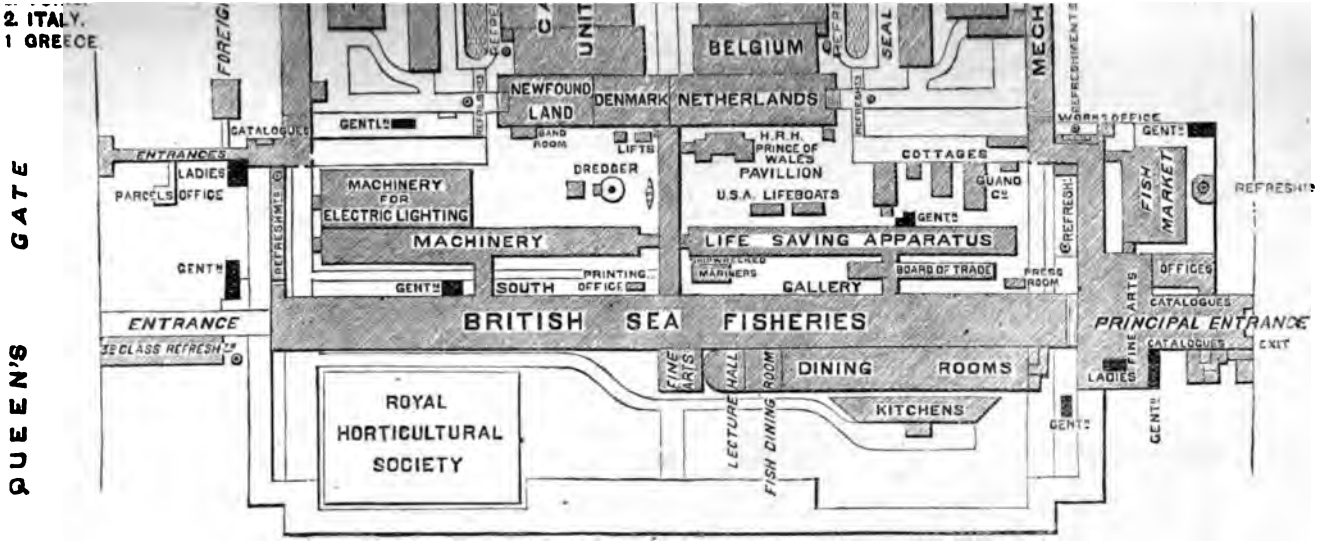


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|---|---|
| | **CLASSIFICATION.** |
| | CLASS I. **FISHING.** |
| | *SECTION I.* **SEA FISHING.** |
| Div. 1 | ..... 1. GEAR OF EVERY DESCRIPTION AND OF ALL NATIONS USED HERRING, LONG LINE, HAND LINE, AND EVERY OTHI SYSTEM OF FISHING, INCLUDING ALL NETS, LIN HARPOONS, TACKLE, &C., EMPLOYED IN THE SAME. |
| Div. 2 | ..... 2. OYSTER DREDGES, CRAB, LOBSTER, PRAWN, &C., POTS, APPLIANCES FOR CATCHING FISH OF THIS DESCRIPTION. |
| | 3. FISHING CRAFT OF ALL NATIONS; MODELS AND REPRESEN THE SAME. |
| Div. 3 | ..... (i.) Steam Fishing Vessels and Steam Carriers. |
| Div. 4 | ..... (ii.) Fishing Vessels and Boats other than Steam V |
| Div. 5 | ..... 4. ROPES AND CANVAS SUITABLE TO FISHING VESSELS. |
| Div. 6 | ..... 5. STEAM AND HAND CAPSTANS, COMPASSES, BAROMETERS, LIGHTS, LAMPS, FOG HORNS, SYSTEMS OF SIGNALLING FOR FISHING FLEETS AND VESSELS, ELECTRIC LIGHTS PAINT, AND OTHER EQUIPMENT OF FISHING VESSELS, FISHERMEN. |
| Div. 7 | ..... 6. MODELS OF HARBOURS, PIERS AND SLIPS, FOR FISHING PU |
| Div. 8 | ..... 7. FISHING TACKLE AND NETTING IN DIFFERENT STAGES OF P AND MACHINERY USED FOR WORKING UP THE RAW MA |
| Div. 9 | ..... 8. LIFE BOATS, THEIR EQUIPMENT, AND LIFE-SAVING APPARAT DESCRIPTION. |
| Div. 10 | ..... 9. APPLIANCES AND METHODS FOR BREAKING THE FORCE OF THE ENTRANCE OF HARBOURS AND ELSEWHERE. |
| Div. 11 | ..... 10. METHODS OF COMMUNICATION FROM THE SHORE TO LIGH FISHING FLEETS BY SUBMARINE CABLES; TELEPHON MEANS OF SIGNALLING. |
| Div. 12 | ..... 11. METHODS OF PROTECTING SUBMARINE CABLES FROM FISHING OPERATIONS (ILLUSTRATED BY MODELS AND I |
| | *SECTION II.* **FRESHWATER FISHING.** |

| This column. | |
|---|---|
| | **CLASS III. COMMERCIAL AND ECONOMIC.** |
| | 1. PREPARATION, PRESERVATION, AND UTILISATION OF FISH, AND ALL FORMS OF LIFE INCLUDED IN CLASS V. |
| | (*a*) For edible purposes— |
| 15 | .. .. .. .. .. .. .. .. i. Models of fish-curing establishments. Methods of, and models and other representations of any appliances for, drying, curing, salting, smoking, tinning, cooking, &c. |
| 16 | .. .. .. .. .. .. .. .. ii. Fish dried, smoked, cured, salted, tinned, or otherwise prepared for food. |
| 17 | .. .. .. .. .. .. .. .. iii. All products prepared from fish, such as oils, roes, isinglass, &c. |
| 18 | .. .. .. .. .. .. .. .. iv. Antiseptics suitable for preserving fish for food. |
| | (*b*) For other than edible purposes— |
| 19 | .. .. .. .. .. .. .. .. i. Oils, manures, and other products prepared from fish. |
| 20 | .. .. .. .. .. .. .. .. ii. Methods of, and models, and other representations of appliances for, preparing oils and manures from fish. |
| 21 | .. .. .. .. .. .. .. .. iii. Sea and fresh water pearl shells; mother-of-pearl manufactured; pearls sorted. |
| 22 | .. .. .. .. .. .. .. .. .. iv. Preparation and application of sponges, corals, pearls, shells, and all parts and products of aquatic animals, &c., to purposes useful and ornamental, with specimens. |
| | 2. TRANSPORT AND SALE OF FISH. |
| 23 | .. .. .. .. .. .. .. (*a*) Appliances for carrying fish and for preserving fish during transport or otherwise, and models of the same. |
| 24 | .. .. .. .. .. .. .. (*b*) Models of fish markets, and appliances connected with the same. |
| | **CLASS IV. FISH CULTURE.** |
| 25 | .. .. .. .. .. 1. MODELS OR DRAWINGS OF FISH HATCHING, BREEDING AND REARING ESTABLISHMENTS, INCLUDING OYSTER AND OTHER SHELLFISH GROUNDS; AND ALL APPARATUS AND IMPLEMENTS CONNECTED WITH THE SAME, AND FOR TRANSPORTING FISH AND FISH OVA. FOOD FOR FRY. |
| 26 | .. .. .. .. .. 2. REPRESENTATIONS ILLUSTRATIVE OF THE DEVELOPMENT AND PROGRESSIVE GROWTH OF FISH. |
| 27 | .. .. .. .. .. 3. MODELS AND DRAWINGS OF FISH PASSES AND FISH LADDERS. |
| | 4. SCIENTIFIC INVESTIGATION. |
| 28 | .. .. .. .. .. .. .. .. i. Models and drawings of diseases of fish, with special reference to their origin and cure. |
| 29 | .. .. .. .. .. .. .. .. ii. Processes for rendering streams polluted by sewage and chemical or other works innocuous to fish life (illustrated by models and drawings). |
| 30 | .. .. .. .. .. .. .. .. iii. Physico-chemical investigation into those qualities of salt and fresh water which affect aquatic animals; investigation of the bottom of the sea and of lakes, shown by samples; aquatic plants in relation to fishing, &c.; researches into the aquatic fauna (animals of the several classes, preserved in alcohol or prepared, &c.); apparatus and implements used in such researches. |
| 31 | .. .. .. .. .. 5. ACCLIMATISATION OF FISH. |
| | **NATURAL HISTORY.** |
| | **CLASS V.** [AQUARIA.] |
| | 1. SPECIMENS, LIVING (MARINE AND FRESH WATER), FRESH STUFFED OR PRESERVED, CASTS, DRAWINGS, AND REPRESENTATIONS OF— |
| 32 | .. .. .. .. .. .. .. (*a*) Algæ to be arranged under genera and species with localities appended. |
| 33 | .. .. .. .. .. .. .. (*b*) Sponges, in their natural state. |
| 34 | .. .. .. .. .. .. .. (*c*) Corals, in their natural state, polyps, jelly-fish, &c. |
| 35 | .. .. .. .. .. .. .. (*d*) Entozoa and epizoa. |
| 36 | .. .. .. .. .. .. .. (*e*) Mollusca of all kinds and shells not included in Class III. |
| 37 | .. .. .. .. .. .. .. (*f*) Starfishes, sea urchins, holothuriæ. |
| 38 | .. .. .. .. .. .. .. (*g*) Worms used for bait, or noxious; leeches, &c. |
| 39 | .. .. .. .. .. .. .. (*h*) Perfect insects and larvæ of insects which are destroyers of spawn, or serve as food for fish. |
| 40 | .. .. .. .. .. .. .. (*i*) Crustacea of all kinds. |

| Exhibitors to quote the Number in this Column. | |
|---|---|
| | **NATURAL HISTORY.—*continued.*** |
| Div. 51 | ..... (*k*) FISH OF ALL KINDS. |
| Div. 52 | ..... (*l*) Reptiles, such as tortoises, turtles, terrapins, lizard frogs, newts, &c. |
| Div. 53 | ..... (*m*) Aquatic and other birds hostile to fish or fishing. |
| Div. 54 | ..... (*n*) Aquatic and amphibious mammalia (otters, seals, w and others detrimental to fish. |
| Div. 55 | ..... 2. WORKS ON ICHTHYOLOGY. MAPS ILLUSTRATING GEOGRAP TRIBUTION, MIGRATION, &c., OF FISHES AND SPAWN. |
| Div. 56 | ..... 3. SPECIMENS AND REPRESENTATIONS ILLUSTRATIVE OF THE BETWEEN EXTINCT AND EXISTING FISHES. |
| | **HISTORY AND LITERATURE OF** |
| | CLASS VI. FISHING—FISHERY LAWS—FISH COMMERC |
| Div. 57 | ..... 1. ANCIENT FISHING IMPLEMENTS OR THEIR REPRODUCTIONS —PICTURES—BOOKS—EMBLEMS—CHARTERS AND SEAL CIENT FISHERMEN GUILDS. |
| Div. 58 | ..... 2. FISHERY LAWS OF DIFFERENT COUNTRIES. |
| Div. 59 | ..... 3. COPIES OF TREATIES, CONVENTIONS, &C., DEALING WITH INTE FISHERY RELATIONS. |
| Div. 60 | ..... 4. REPORTS, STATISTICS AND LITERATURE OF FISH, FIS FISHERIES. |
| Div. 61 | ..... 5. REPORTS ON ACCLIMATISATION OF FISH, AND OF ATTEM DIRECTION. |
| | **LOAN COLLECTIONS.** |
| | CLASS VII. COLLECTIONS WITHIN THE SCOPE OF THE GOING CLASSES. |

## REGULATIONS.

1.—A Great International Fisheries Exhibition, under the patronage of Her Majesty the Queen and the Presidency of H.R.H. the Prince of Wales, will be held in London in 1883.

2.—The Exhibition will be opened on the 12th of May by Her Majesty the Queen, and continue open for a period of not less than six months.

3.—The principal objects to be admitted are comprised in the annexed Classification, which is intended to include all kinds of specimens of fish life, and to illustrate all the modes by which the MARINE and FRESH WATER animals of economic value are captured and utilised, together with the commercial, scientific, social, historic, and legislative aspects of such fisheries.

4.—Government and other Medals in Gold, Silver, and Bronze, and State Diplomas of Honour, will be awarded by a Jury, the composition of which will be settled later.

5.—No charge will be made for space, but Exhibitors will have to pay every expense of transit, delivery, fixing, and removing their Exhibits, and they must, either personally or by their Agents, superintend the reception and installation, and at the close of the Exhibition, the removal of their goods; in default thereof, the Committee reserves to itself the right of doing whatever may be considered necessary, and at the expense of the Exhibitor.

6.—Applications for admission must be made on printed forms, which will be supplied on application; these are to be sent to the Secretary in London on or before the 1st November, 1882.

7.—The General Secretary will, as soon as practicable, notify to applicants the decision of the Committee, and will indicate the space, if any, which has been accorded to them, and give to each a number.

8.—Contributors to the Loan Department are requested to communicate with the Secretary, who will supply forms to be filled up by them.

9.—The Foreign Correspondents that may be appointed are invited to enter as soon as possible into communication with the Secretary. The Correspondent will be charged with the consideration of all questions relative to the distribution of the space allotted to his country. The Committee will therefore not correspond directly with foreign Exhibitors, except in those countries where no Correspondent is appointed.

10.—The Committee will place at the disposal of Foreign Correspondents all information and plans that may be useful for their arrangements.

11.—The applicants for space from countries in which no Correspondent has been appointed will correspond directly with the Secretary of the Committee.

12.—The Committee will endeavour to obtain, from the various English Railway Companies, special terms for the conveyance of exhibits to and from the Exhibition, and should they succeed in doing so, such arrangements will be communicated to intending Exhibitors.

13.—The Committee will not interfere in any way between the Railway Companies, the Carriers and the Exhibitors, with reference to the dispatch, transmission, reception, management, or return of goods exhibited.

14.—All packages containing goods intended for exhibition must have painted on them the distinctive mark (I. F. E.) in red paint, and they must also have painted on them the name and number of the Exhibitor.

15.—The waybill accompanying all packages must contain the name of the Exhibitor, his number and address.

16.—Each Exhibitor must provide, either personally or through an Agent, for the dispatch, transmission, reception, unpacking, and arrangement of his goods, and for the verification of their contents when unpacked. If neither the Exhibitor nor his Agent be present to receive the packages on arrival at the Exhibition the Carrier will be directed to take them away; but should any goods be deposited in the Exhibition premises during the absence of the Exhibitor or his Agent, the Committee will not be responsible for any loss or damage from whatsoever cause arising.

17.—Packages from Foreign Countries must likewise have painted on them n distinctive marks the letters (I. F. E.) in red paint. They must be addressed to the Exhibitor himself or his Agent. They must all be marked in such a way as to show distinctly from whence they come, the name of the country and the number of the Exhibitor being painted legibly thereon.

Passages.

18.—Exhibition Spaces.—The space granted to an Exhibitor Building is available for floor space exclusive of the passages for the

Show Cases.

19.—Show Cases.—No particular form or design is prescribe counters, platforms, &c., but they must not exceed the following hei the special written permission of the Committee:—

| | | | |
|---|---|---|---|
| Show cases and partitions | 10 feet | above the floor. | |
| Counters .. .. | 3 | do. | do. |
| Platforms .. | 1 foot | | do. |

Railings.

20.—Exhibitors may place Railings of a uniform height of 2 above the floor level. In every instance the railings must be with the "stand," *i.e.* the space allotted.

Floors.

21.—The flooring must not be altered, removed, or strengthenec venience of arrangement, except by sanction of the Committee expense of the Exhibitor.

No Obstructions.

22.—No Exhibitor will be permitted to display exhibits in such to obstruct the light or vistas through the avenues, or to occasion i injury, or otherwise disadvantageously affect the display of other Ex

Decorations.

23.—Decorations.—In order to ensure uniformity of decoration good effect, no Exhibitor will be allowed to put up any flags, ban kind of decoration without permission.

Signs.

24.—Signs.—No sign or name-board may be placed otherwise with the main passages, that is, parallel with the frontage of t stands, and should be as near to the back of the space as possibl interfere with the vista. The signs to be black and gold. All s hung subject to the approval of the Committee.

Placards.

25.—No printed or written bills may be displayed unless the design.

Exhibitors' Offices.

26.—Offices.—Any Exhibitor who may obtain permission to e on his allotted space must conform to the following rules:—

The office must not exceed 8 feet in height: must be back of the stand, unless otherwise sanctioned; painted black and varnished, with gilt beadings.

Empty Cases, immediate removal.

27.—The spaces outside the allotments for Exhibitors being the necessities of circulation, packages and empty cases will not remain there. Cases must be unpacked as fast as received, and the taken away by the Exhibitors or their agents. The Committe accept any responsibility with reference to empty cases, which m removed from the building at the expense of Exhibitors.

Empty Cases.

28.—The Committee will have nothing whatever to do with or the preservation of empty cases, or reserve any space for the pur

Exhibitors to keep Stands clean.

29.—Exhibitors will be required to provide all necessary atten keep their stands and exhibits properly cleaned and in good orde whole period of the Exhibition.

Non-transfer.

30.—No Exhibitor will be allowed to transfer any allotment, or other than his own duly admitted exhibits to be placed thereo permission of the Committee.

Exhibitor's Name.

31.—All goods exhibited must be in the name of the person wh application form.

Selling Price.

32.—Exhibitors, being traders, are requested to mark the selling articles exhibited complete, so as to facilitate the judgment of well as for the information of visitors.

Non-removal and Perishable Articles.

33.—Objects sold cannot be taken away before the close of th without the special permission of the Committee. Special arran be made with regard to perishable exhibits.

Water, Gas, or Steam Machinery in Motion.

34.—Exhibitors of apparatus requiring the use of water, gas, or state on applying for admission the quantity of water, gas or steam may consider necessary. Those who wish to show machinery in state the rate of speed at which the machine is to be driven. Th of all counter shafting, pulleys, gas, water, steam, &c., must be a expense of the Exhibitor, but under the direct control of the C their appointed officer.

Dangerous Substances.

35.—All fulminating and explosive substances and all dangerous s absolutely forbidden to be sent.

Receptacles.

36.—Spirits, alcohol, oils, essences, corrosive substances, and substances which might spoil other articles or inconvenience the only be received in solid and suitable vessels of small size.

37.—The Committee reserve the sole right of compiling a catalogue of the exhibits under regulations which will be duly notified. Each nation will, however, have the right to produce, at its own expense, but in its own language only, a catalogue of all the objects in its own Section.

38.—All hand-bills, printed matter, &c., for gratuitous distribution, connected with exhibits, will be under special regulations, and must first receive the approval and permission of the Committee, which may be withdrawn at any time.

39.—No article exhibited may be photographed, drawn, copied, or reproduced in any manner whatsoever, without the special sanction of the Committee.

40.—The Committee will not hold itself responsible for any loss or damage occurring to any exhibit from any cause whatsoever, but, while declining any responsibility, it is the intention of the Committee to take such precautions as they deem necessary.

41.—Future regulations will settle in due time the arrangements for the date of reception, location of goods, tickets of admission for Exhibitors and assistants, and the formation and working of the Jury.

42.—The right to add to, alter, amend, or expunge, any of these Rules is reserved by the Committee.

43.—Both Englishmen and Foreigners in becoming Exhibitors declare by so doing their compliance with the whole of these Regulations, together with such other Regulations as the Committee may issue from time to time.

44.—The Committee reserve the right to remove the objects belonging to any Exhibitor who shall not conform to the Regulations.

45.—If any damage or injury shall be caused or occasioned during the Exhibition by any exhibited machine, implement, or article to any visitor or other person, or to any officer, servant, or others then and there employed by the Committee of the Great International Fisheries Exhibition, 1883, then the Exhibitor to whom such machinery, implement, or article may belong shall indemnify and hold harmless the said Committee from and against all actions, suits, expenses, and claims on account or in respect of any such damage or injury which may be so caused or occasioned.

## LIST OF SPECIAL PRIZES SUPPLEMENTARY REWARDS DESCRIBED IN PARAGRAPH 4 REGULATIONS.

| SUBJECTS FOR SPECIAL PRIZES. | VALUE. | NAME OF |
|---|---|---|
| **SEA-FISHING.** | | |
| 1.—Apparatus and Gear complete for a Trawler—Sail or Steam .. .. .. .. .. .. .. | £15 | THE LOW TRADERS. |
| 2.—Apparatus and Gear complete for a Drifter .. | £15 | |
| 2A.—Collection of Bowls, Buoys, and Bladders, for Drift and Surface Fishing .. .. .. .. | £10 | THE COMMI GREAT FISHERIES |
| 3.—Model or Specimen of an Improved Trawl Net, capable of allowing immature Fish and Refuse to escape therefrom .. .. .. .. .. .. | £52 10s. | THE MAYOR TION OF Y |
| 4.—Herring Net .. .. .. .. .. .. .. .. | £10 | J. L. SAYER, |
| 5.—Mackerel Net .. .. .. .. .. .. .. .. | £10 | J. L. SAYER, |
| 6.—Stow Net .. .. .. .. .. .. .. .. .. | £5 | |
| 7.—Bratt Net .. .. .. .. .. .. .. .. .. | £5 | |
| 8.—Sprat Net .. .. .. .. .. .. .. .. .. | £5 | |
| 9.—Collection of Rope suitable for Fishing Vessels . | £10 | |
| 10.—Collection of Long Lines, Hand Lines, and Snooding .. .. .. .. .. .. .. .. | £5 | |
| 11.—Collection of Long Line Gear, Complete .. .. | £5 | |
| 12.—Collection of Hand Line Gear, Complete .. .. | £5 | |
| 13.—Collection of Hooks .. .. .. .. .. .. | £10 | THE COMMI GREAT FISHERIES |
| 14.—The Best and most Improved Mode of Curing Pilchards so as to make them an Article of Food for Home Consumption. Trial to take place as soon as the Pilchard Fishing commences in 1883, for Home Consumption within ten days .. .. .. .. .. .. .. .. | £20 | |
| 15.—For Improvements in the Method of capturing Pilchards at a Distance from the Land with Seine Nets .. .. .. .. .. .. .. .. | £10 | |
| 16.—For the Best and most Economical Mode, consistent with efficiency, of Preserving Nets and Tackle from Rotting .. .. .. .. .. | £20 | B. M. BRADE THE TOWN O £10. |
| 17.—For Lobster and Crab Pots, permitting the escape of those undersized .. .. .. .. .. | £10 | THE COMMI GREAT I FISHERIES I |
| 18.—Model of a Steam Trawler .. .. .. .. .. | £25 | |
| 19.—Model of a Steam Fishing Vessel, best adapted to Herring and other Fisheries .. .. .. .. | £25 | LOWESTOFT T SIONERS. |
| 20.—Model of a Steam Fish Carrier .. .. .. .. | £52 10s | LONDON FISH CIATION. |
| 21.—Model of a Sailing Trawler .. .. .. .. .. | £25 | R. D. ODELL, |
| 22.—Model of a Drifter for the Herring Fisheries .. | £25 | Mr. Deputy £10. |
| 23.—Model of a Well Vessel adapted for Cod and other Fisheries .. .. .. .. .. .. .. | £10 | THE COMMIT GREAT I FISHERIES I |
| 24.—Model of a Stow Boat as used for Sprat and other Fisheries .. .. .. .. .. .. .. | £10 | |
| 25.—Model of a Shrimp Boat .. .. .. .. .. | £10 | MESSRS. LYNN |
| 26.—Boat, full size, complete with all fittings, for Off-shore Fishing in rough weather, requiring not more than four hands—the first consideration being stability in a surf; the second, cost; the third, weight .. .. .. .. .. .. .. | £15 | CAPTAIN H. M |

| ıJECTS FOR SPECIAL PRIZES. | VALUE. | NAME OF DONOR. |
|---|---|---|
| Boat with a handier and safer ıe Lug-sail, and not requiring to be very tack in beating to windward .. | £10 | THE COMMITTEE OF THE GREAT INTERNATIONAL FISHERIES EXHIBITION. |
| e (full size) .. .. .. .. .. | £10 | |
| ·oat used in the Whale and Seal ogether with all kinds of Apparatus used in those Fisheries .. .. .. | £20 | |
| 'ishing Boat of not less than 45 feet ed to the Fisheries on the East Coast l and Scotland (having special re- e rig and prevention of shifting of .. .. .. .. .. .. .. .. | £25 | The Hon. E. MARJORIBANKS, M.P. |
| dapted for conveying Fish from the the Carrier .. .. .. .. .. | £60 | GEORGE EDWARDS, Esq. |
| ll be awarded unless the Boat is ted to preserving the lives of her | | |
| a Boat adapted for the Drift oth of Mackerel and Pilchard .. | £10 | THE COMMITTEE OF THE GREAT INTERNATIONAL EXHIBITION. |
| ·f Canvas suitable for Fishing .. .. .. .. .. .. .. .. | £10 | |
| an for Fishing purposes .. .. .. | £10 | THE TOWN OF LOWESTOFT. |
| ın for Fishing purposes .. .. .. | £10 | |
| , *LIFE-SAVING APPARATUS, &c., &c.* | | THE COMMITTEE OF THE GREAT INTERNATIONAL FISHERIES EXHIBITION. |
| ; full-sized Life-boat, fully equipped ırriage, adapted to aid stranded or essels, from the Shore, in Gales of through heavy broken Seas and .. .. .. .. .. .. .. .. | £600 | |
| t Model of a Life-boat, to be made to exceeding 1½ inches, nor less than ıch to the foot, each Model to be ɔd by a certificate of the scale to built .. .. .. .. .. .. .. | £75 | HEYWOOD LONSDALE, Esq. |
| *Prize No.* 36 *are not eligible for this Prize.* | | |
| Apparatus of every Description .. | £25 | THE MARQUIS OF EXETER. |
| st suitable Life-Jacket, or Dress, for the lives of Fishermen engaged in transporting Fish from Smacks to The principal requisites are, that it of such a nature as to be of as little ıce as possible to the wearer, and ble at all times when he is engaged ty .. .. .. .. .. .. .. .. | £25 | HEYWOOD LONSDALE, Esq. |
| , by Models or otherwise, of Methods ıg the Force of the Waves at the ɔf Harbours .. .. .. .. .. | £50 | THE COMMITTEE OF THE GREAT INTERNATIONAL FISHERIES EXHIBITION. |
| Method of Communication from the ishing Fleets .. .. .. .. .. | £25 | |
| ·thod of protecting Submarine Cables r by Fishing operations .. .. .. | £10 | |

| SUBJECTS FOR SPECIAL PRIZES. | VALUE. | NAME OF D |
|---|---|---|
| **FRESH-WATER FISHERIES.** | | |
| In awarding Prizes in this Section, 41 to 59, regard will be had rather to the excellence than to the number of Exhibits in each Collection. | | |
| 1.—*FLY-FISHING.* | | |
| 41.—Collection of Salmon Rods .. .. .. .. .. | £10 | W. BURDETT-C |
| 42.—Collection of Trout Rods .. .. .. .. .. | £10 | |
| 43.—Collection of Split-cane Rods .. .. .. .. | £5 | |
| 44.—Collection of Salmon or Trout Reels .. .. .. | £5 | |
| 45.—Collection of Salmon Lines .. .. .. .. .. | £10 | THE COMMITT GREAT IN FISHERIES E |
| 46.—Collection of Trout Lines .. .. .. .. .. | £10 | |
| 47.—Collection of Salmon and Trout Gut Casts .. | £10 | |
| 48.—General Collection of Flies .. .. .. .. .. | £10 | |
| 49.—General Collection of Salmon or Trout Flies for England .. .. .. .. .. .. .. .. .. | £5 | D. VIGO, Esq. |
| 50.—General Collection of Salmon or Trout Flies for Scotland .. .. .. .. .. .. .. .. | £5 | MESSRS. SAVER |
| 51.—General Collection of Salmon or Trout Flies for Ireland .. .. .. .. .. .. .. .. .. | £5 | |
| 52.—Collection of Materials used in Dressing Salmon and Trout Flies .. .. .. .. .. .. .. | £5 | |
| 2.—*FISHING OTHER THAN FLY-FISHING.* | | |
| 53.—Collection of Rods other than Fly Rods .. .. | £10 | |
| 54.—Complete Collection of Tackle and Angling Appliances .. .. .. .. .. .. .. .. | £10 | |
| 55.—Complete Collection of Tackle and Angling Appliances for Bottom-Fishing, comprising minimum of Cost with excellence .. .. .. | £10 | |
| N.B.—For this Prize each Exhibitor must quote the price at which he will guarantee to supply any number of his Exhibit. | | |
| 56.—Collection of Artificial Baits .. .. .. .. .. | £10 | |
| 3.—*MISCELLANEOUS.* | | THE COMMITT GREAT IN FISHERIES E |
| 57.—Collection of Gut in successive stages of manufacture .. .. .. .. .. .. .. .. .. | £5 | |
| 58.—Collection of Hooks of all Descriptions for Fresh-water Fishing .. .. .. .. .. .. .. | £10 | |
| 59.—Collection of Boots, Waders, Fishing Stockings, Brogues, &c. .. .. .. .. .. .. .. .. | £5 | |
| 60.—Suit of Angler's Apparel, including Hat .. .. | £5 | |
| 61.—Eel Trap for Rivers, not to interfere with other Fisheries .. .. .. .. .. .. .. .. | £10 | |
| 62.—Salmon Net .. .. .. .. .. .. .. .. | £10 | |
| 63.—Punt for Fishing purposes .. .. .. .. .. | £10 | |
| 64.—Rowing Boat for Fishing purposes .. .. .. | £10 | |
| 65.—Portable or Collapsible Boat .. .. .. .. | £10 | |
| **ECONOMIC CONDITION OF FISHERMEN.** | | |
| 66.—Exhibit of Waterproof Clothing for Sea Fishermen .. .. .. .. .. .. .. .. .. | £10 | |
| 67.—Exhibit of Sea Fishermen's Clothing, other than Waterproof .. .. .. .. .. .. .. | £10 | |
| **COMMERCIAL AND ECONOMIC.** | | |
| 68.—Model of Fish-Curing Establishment .. .. | £75 | TOWN OF YARM |
| 69.—Collection of Smoked Fish .. .. .. .. .. | £20 | THE COMMITTE GREAT INT FISHERIES EX |
| 70.—Collection of Pickled and Salted Fish .. .. | £10 | |
| —Collection of Dry Salted Fish .. .. .. .. | £10 | |
| Collection of Tinned Fish of all Kinds .. .. | £10 | |

| SUBJECTS FOR SPECIAL PRIZES. | VALUE. | NAME OF DONOR. |
|---|---|---|
| e best Apparatus for the Conveyance of ing Salmonidæ, by Road and Rail .. .. | £10 | THOMAS JAMES MANN, Esq. |
| rating Apparatus for Fishing Vessels .. | £20 | THE COMMITTEE OF THE GREAT INTERNATIONAL FISHERIES EXHIBITION. |
| est and most Economical Machine for Manufacture of Ice for Fishing purposes .. | £10 | |
| ns for a Fish Market .. .. .. .. .. | £52 10s. | THE CORPORATION OF LIVERPOOL. |
| and Plans of a Fish Market .. .. .. | £20 | THE BARONESS BURDETT-COUTTS. |
| **FISH CULTURE.** | | |
| e best Hatching Apparatus for Salmo- .. .. .. .. .. .. .. .. .. | £5 | COLONEL CUSTANCE. |
| ie best Coarse Fish Hatching Apparatus | £5 | THE COMMITTEE OF THE GREAT INTERNATIONAL FISHERIES EXHIBITION. |
| ie best Deep-sea Hatching Apparatus .. | £5 | |
| e best Rearing Apparatus .. .. .. | £5 | |
| he best Living Specimens of Yearling , not less than twenty-five in number .. | £3 | |
| e best Fish Culture Establishment for ing and Rearing 100,000 Salmonidæ, ning Efficiency with Economy .. .. | £15 | |
| e best Fish Culture Establishment for ing and Rearing 300,000 Salmonidæ and ds, combining Efficiency with Economy | £25 | |
| Best and Most Practical Model or Plan Series of Fish Ponds for the Culture of water Fishes, the scale to be not less 1 inch to the yard, and not to exceed 3 to the yard .. .. .. .. .. .. | £12 | JAMES H. CROSSMAN, Esq. |
| ie Best Description of the way in which Ponds can be Constructed, and Guidance eir Management .. .. .. .. .. .. | £3 | |
| best Apparatus for, or Method of, pro- g Young Brood and Oysters against Dog es and other natural enemies .. .. .. | £10 | THE COMMITTEE OF THE GRAND INTERNATIONAL FISHERIES EXHIBITION. |
| Best and most Economical Invention or vement of any Implement or Apparatus * e in the Culture of Shell-fish .. .. .. | £10 | |
| **NATURAL HISTORY.** | | |
| ction of Stuffed Freshwater Fish, taken Rod and Line within the United Kingdom, *fide* the property of London Angling , and caught by their present or past ers only .. .. .. .. .. .. .. .. | £20 | THE COMMITTEE OF THE GREAT INTERNATIONAL FISHERIES EXHIBITION. |
| ction of Stuffed Freshwater Fish, taken Rod and Line within the United Kingdom, *fide* the property of Provincial Angling , and caught by their present or past ers only .. .. .. .. .. .. .. .. | £20 | |
| ction of Stuffed Fish, shown by and the *fide* property of a private Exhibitor, all taken with Rod and Line within the d Kingdom .. .. .. .. .. .. .. | £20 | |
| ion of Fresh-water Fish, made and ex- d by private individuals .. .. .. .. | £5 | |
| on of Thames Trout, caught by Exhibitor, Rod and Line .. .. .. .. .. .. | £10 | |
| ion of Salmo Fario, in all varieties, caught d and Line, and caught by Exhibitor .. | £10 | |
| Specimens of Taxidermy, more par- rly with regard to Stuffed Fish .. .. | £10 | |
| terms are used in their *widest sense*, | | |

| SUBJECTS FOR SPECIAL PRIZES. | VALUE. | |
|---|---|---|
| **FRESH-WATER FISHERIES.** | | |
| In awarding Prizes in this Section, 41 to 59, regard will be had rather to the excellence than to the number of Exhibits in each Collection. | | |
| 1.—*FLY-FISHING.* | | |
| 41.—Collection of Salmon Rods .. .. .. | | |
| 42.—Collection of Trout Rods .. .. .. | | |
| 43.—Collection of Split-cane Rods .. .. | | |
| 44.—Collection of Salmon or Trout Reels | | |
| 45.—Collection of Salmon Lines .. .. | | |
| 46.—Collection of Trout Lines .. . | 10s. | THE COMMI[illegible] |
| 47.—Collection of Salmon and Trout | £2 10s. | GREAT I[illegible] |
| 48.—General Collection of Flies .. .. | £2 10s. | FISHERIES [illegible] |
| 49.—General Collection of Salmo[illegible] .. .. | £2 10s. | |
| England.. .. .. .. .. .. .. | £2 10s. | |
| 50.—General Collection of So[illegible] .. .. | £2 10s. | |
| Scotland .. .. .. .. .. .. | £2 10s. | |
| 51.—General Collection of [illegible] .. .. .. | £2 10s. | |
| Ireland .. .. .. .. .. .. .. | £2 10s. | |
| 52.—Collection of Mat[illegible] .. .. .. .. .. | £2 10s. | |
| and Trout Fl[illegible] .. .. .. .. .. .. | £2 10s. | |
| | £5 | |
| 2.—*FISHING* [illegible] awarded for Specimens of [illegible] included in this List. | | |
| 53.—Collection [illegible] | | |
| 54.—Complet[illegible] App[illegible] | | |
| 55.—Comr[illegible] A[illegible] r[illegible] | | |
| N[illegible] the [illegible] m[illegible] | | |
| 56.— | | |

[redacted]

# INTRODUCTION.

bjects which peculiarly commend themselves to
in the foundations than in the surface of
nature unobtrusive and remote from view.
's a necessary accompaniment to their
ntain their manufactures; no gigantic
ance. Fishermen do not meet us at every
s in the country, or the tradesmen and mechanics
in the presence of a shop here and there, does their
slightest perceptible trace in a provincial or a metro-
As for the fish themselves, they not unnaturally prefer the
of the ocean to the most luxurious slab of a fishmonger's shop,
most delicate attentions of a west-end cook. Everything connected
the industry is, in fact, almost wholly concealed from the view of those
rectly employed in carrying it on. Its principal scene of maintenance
the desolate ocean, out of sight for the most part, not merely of the
rs upon the shore, but even of the passing ships which traverse the
wastes. The towns and villages which its pursuers inhabit are
ated by few except the masters and the workmen of the craft; the
s are rare, and their surroundings by no means inviting; and even the
receive but passing notice or recognition. To many persons all that
ats the fisherman's craft consists of a single dish in the course of an
te dinner; and not many years have elapsed since the habitual use of
cept on festive occasions, was considered in a middle-class household as
tom of extravagance rather than of thrift. And yet how vast an
t is overlooked by so superficial a view will be evident upon very slight
n. For in fact neither hunting, nor shooting, nor agriculture itself,
mode whatsoever of obtaining the necessaries of existence for the
which clamour for them can vie with this ancient and wide-spread
y. Fishing, so far as the prime object of all labour, the sustentation
n life, is concerned, is an occupation which claims one entire element
terraqueous globe for its undisputed province. There is scarcely a
throughout the world, from Greenland to Carpentaria, and from
to Japan, to the shores of which the fishing-boat is a stranger. Nor
is statement by any means exhaust the whole case. Not in the sea
an this interesting and remunerative occupation be pursued with
e, for lakes and rivers in every land teem with superabundant
prodigal of food and wealth. However much therefore the increase
plicity of devices for the capture of fish may have escaped general
ere can be little wonder that they should have attracted the
of such as give their minds to the furtherance of the welfare of their
n, and more particularly to the development of such resources and

| SUBJECTS FOR SPECIAL PRIZES. | VALUE. | NAME OF DONOR. |
|---|---|---|
| *INDIVIDUAL SPECIMENS OF LOAN COLLECTION, CAUGHT BY ROD AND LINE.* | | |
| 89.—Salmo Salar .. .. .. .. .. .. .. .. .. | £5 | THE COMMITTEE GREAT INTE[illegible] FISHERIES EXHI[illegible] |
| 90.—Salmo Ferox .. .. .. .. .. .. .. .. .. | £5 | |
| 91.—Salmo Eriox .. .. .. .. .. .. .. .. .. | £5 | |
| 92.—Salmo Trutta .. .. .. .. .. .. .. .. .. | £2 10s. | |
| 93.—Salmo Fario, in any variety .. .. .. .. .. | £5 | |
| 94.—Thames Trout .. .. .. .. .. .. .. .. .. | £5 | |
| 95.—Grayling .. .. .. .. .. .. .. .. .. .. | £2 10s. | |
| 96.—Pike .. .. .. .. .. .. .. .. .. .. .. | £5 | |
| 97.—Perch .. .. .. .. .. .. .. .. .. .. | £2 10s. | |
| 98.—Carp .. .. .. .. .. .. .. .. .. .. .. | £2 10s. | |
| 99.—Tench .. .. .. .. .. .. .. .. .. .. | £2 10s. | |
| 100.—Barbel .. .. .. .. .. .. .. .. .. .. | £2 10s. | |
| 101.—Bream .. .. .. .. .. .. .. .. .. .. | £2 10s. | |
| 102.—Chubb .. .. .. .. .. .. .. .. .. .. | £2 10s. | |
| 103.—Roach .. .. .. .. .. .. .. .. .. .. | £2 10s. | |
| 104.—Rudd .. .. .. .. .. .. .. .. .. .. | £2 10s. | |
| 105.—Dace .. .. .. .. .. .. .. .. .. .. | £2 10s. | |
| 106.—Burbolt (Eel-Pout) .. .. .. .. .. .. .. | £2 10s. | |
| 107.—Eel .. .. .. .. .. .. .. .. .. .. .. | £2 10s. | |
| 108.—Black Bass .. .. .. .. .. .. .. .. .. | £2 10s. | |
| 109.—Sturgeon .. .. .. .. .. .. .. .. .. | £5 | |

N.B.—Prizes will be awarded for Specimens of Fresh-water Fish not included in this List.

# INTRODUCTION.

ing and Fishermen are subjects which peculiarly commend themselves to e who are interested rather in the foundations than in the surface of ety, for they are by their very nature unobtrusive and remote from view. huge chimneys poison the air as a necessary accompaniment to their ours; no great cities rise up to contain their manufactures; no gigantic ildings advertise their importance. Fishermen do not meet us at every n like agricultural labourers in the country, or the tradesmen and mechanics he cities; nor, except in the presence of a shop here and there, does their upation leave the slightest perceptible trace in a provincial or a metro-itan town. As for the fish themselves, they not unnaturally prefer the et depths of the ocean to the most luxurious slab of a fishmonger's shop, the most delicate attentions of a west-end cook. Everything connected h the industry is, in fact, almost wholly concealed from the view of those directly employed in carrying it on. Its principal scene of maintenance n the desolate ocean, out of sight for the most part, not merely of the ellers upon the shore, but even of the passing ships which traverse the ery wastes. The towns and villages which its pursuers inhabit are quented by few except the masters and the workmen of the craft; the kets are rare, and their surroundings by no means inviting; and even the ps receive but passing notice or recognition. To many persons all that resents the fisherman's craft consists of a single dish in the course of an orate dinner; and not many years have elapsed since the habitual use of except on festive occasions, was considered in a middle-class household as mptom of extravagance rather than of thrift. And yet how vast an rest is overlooked by so superficial a view will be evident upon very slight ction. For in fact neither hunting, nor shooting, nor agriculture itself, any mode whatsoever of obtaining the necessaries of existence for the ths which clamour for them can vie with this ancient and wide-spread stry. Fishing, so far as the prime object of all labour, the sustentation uman life, is concerned, is an occupation which claims one entire element he terraqueous globe for its undisputed province. There is scarcely a try throughout the world, from Greenland to Carpentaria, and from rica to Japan, to the shores of which the fishing-boat is a stranger. Nor this statement by any means exhaust the whole case. Not in the sea e can this interesting and remunerative occupation be pursued with antage, for lakes and rivers in every land teem with superabundant urces prodigal of food and wealth. However much therefore the increase multiplicity of devices for the capture of fish may have escaped general ice, there can be little wonder that they should have attracted the ntion of such as give their minds to the furtherance of the welfare of their ntrymen, and more particularly to the development of such resources and

industries as may most conduce to the support of a constantly
population.

Suggestions for the furtherance of these interests have been m
Books over and over again, as in the endeavours to obtain the estab
a Government vessel for the instruction and assistance of fishermen,
made by the late Mr. Frank Buckland; to whose memory no monu
be erected either more in accordance with his own desire, or mor
the debt of gratitude owed to him by the nation, than such an
But Blue Books are easily read, and still more easily left unread, a
speaks so forcibly in behalf of a reform as a practical example of
made patent to the eyes of all men. It is in carrying out such
these that Exhibitions, National and International, discharge thei
tinctive and salutary functions. They collect in a single focus th
rays which illuminate the recesses of the body politic; they p
visible and striking form those features of our industrial and social
almost of necessity escape common observation, and so to speak,
beneath a hive of glass the operations and domestic habits of our h

Few articles connected with Fishing were displayed at the Wor
1851; and such as there were came almost entirely from the United
Angling, in fact, was but little known or appreciated in foreign
there was probably no other country where the manufacturers of
stituted in themselves a distinct trade. Twenty-five British
contributed such sportsman's gear as rods, lines, artificial flies,
while, with the exception of some apparatus for float-fishing eman
France, no foreign manufacturer sent an exhibit illustrative of fis
in salt or fresh water. The model of a smack, however, fitted wit
screw propeller attracted general notice, as the principle had no
viously applied to this class of vessel. Nor were matters perfe
much larger scale when, eleven years later, a second opportunity w
in our metropolis, though some ingenious machinery was shown for
facture of nets, together with a fine assortment of tackle, and model
for service at home and abroad. In 1867 the Imperial Commission
offered a reward for co-operating societies in connection with the
and amongst the successful competitors was the Free Fisheries
Whitstable, incorporated in 1793, and established as a working fi
long before. At Vienna in 1873 models of Swedish and Norwegi
were displayed, and at Philadelphia three years later was presente
machine, invented by Messrs. Baron, and subsequently improved by
for making nets. Another most noticeable feature in Philadelp
complete collection of Models, in papier maché, of the varied an
Marine Fauna, of North America.

Like all vigorous and well-conceived ideas, the notion of a G
national collection of works of industry like the World's Fair of
birth to similar enterprises of a more limited and partial scope. B
wonderful influence exercised by the first and most beautiful of the
and special exhibitions grew up almost from year to year for a
objects and in all sorts of places. In these specialities Cork led th

ı a collection of Irish Arts and Manufactures, and in the following
York, New Brunswick, and Madras gave illustration of their native
ns. Munich and Madrid, Christiania and Brussels, Berne, Sardinia,
and St. Petersburg, promptly took up the cue thus given. Within
thirty years scarcely any land has been without the advantages
from a public display illustrative of national life. There have been
ns from Thurso to Ballarat, and from Paris to Nagasaki. There have
ibitions of particular industries, Exhibitions of Arts, Exhibitions of
s, Exhibitions of the Apparatus of Labour, Exhibitions of the Ap-
of Science, Exhibitions of Corn, of Wine, and of Needlework. The
of Europe have vied with each other at Hamburg; Casques and
have met in assembly at Kioto; even the Bees have had their own
on in London, and the very Fungi have held a Congress all to them-
Aberdeen.

t, fourteen years from the commencement of this magnificent series
trial, art, and scientific triumphs, Fishing and Fisheries asserted
im to a special display. Boulogne, with its semi-aquatic inhabitants
requent memorials of those who have perished in the waters, was the
pen its doors, though both Arcachon and Havre followed its example
sequent period. Especial prominence must be given to the important
e Exposition held at the former of these two last-mentioned towns;
prise which resulted—as we trust will be one of the results of our
hibition—in a great development and improvement of pisciculture.
gue also was the scene of a similar collection in 1867, as was Naples
. But the International Fisheries Exhibition held at Berlin in 1880
all others in extent and variety. Nine great divisions were not more
Ecient for the multiplicity of the objects collected, which ranged from
imens of corals and oysters, and from dried, salted, and smoked pre-
ıs, to documents and emblems, and seals, and all the multifarious
s bearing upon the history of the fishing industry.

uld be foreign to our purpose to dwell upon the particular specimens
d at Berlin, yet one class of objects was of so striking a character as
an excellent example of the incidental illustrations of nature which
t were, the perquisites and rewards of those who endure the labours of
ltifarious tasks as are involved in the establishment of an International
ion. The magnificent collection of sea-fowl was in itself found worthy
onged attention. There were the Falconidæ, the Fagins of aquatic
ho get their prey through the medium of less subtle but more active
the Pandionidæ, haunters of salt and fresh water alike, but lovers in
ar of the rocky islands in the Tuscan sea; the Ardeidæ (the herons),
ch the *Egretta Alba* of Venice belongs; the Phœnicopteridæ (the
oes), which pass in flights year by year over the Sardinian shores; the
ridæ (the petrels), including that unique bird the Oceanides Wilsoni,
f a single specimen alone in the world is preserved in the Museum of
i; and with them were many other different kinds of fowl which
the human fashion of feeding upon the inhabitants of the waters.

ı Germany *this admirable and* most politic conception passed over into

England. We are indebted to Norwich, the capital of the county distingu for its fishing enterprise from time immemorial, for first localising it w these islands. The germ of the idea was due to the Yare Preservation Angling Society, and more specifically to one of its most distingu members, Mr. Howard Taylor. At the Annual Meeting of this Associati 1879, Mr. Taylor suggested the institution of a Fish Museum at Nor while, at the same time, an Act was passed for the protection and preser of fish in relation to the county through the instrumentality of the Society. From the legislation arising out of this movement sprang important Society for the Acclimatization of Fish; and when the p of a museum was found difficult of execution, their Secretary, Mr. Ol Chambers, conceived the happy notion of holding a Fisheries Exhib in the county capital—a proposition warmly accepted and endorsed by President, Mr. Birkbeck, the Member for the Northern Division of the co A small and energetic Executive soon threw themselves into the work just as the project of a Museum had been superseded by that of an Exhib so now the local character of the institution gradually widened i national undertaking. Several public bodies quickly recognised the val the design, and assistance flowed in from many quarters. A handsome don was voted for the purpose by the Corporation of London, and that an City guild, the Fishmongers' Company, then as now lent their pow influence.

Government recognition was also obtained, chiefly through the agen Mr. Birkbeck, and an official sanction was procured for holding the Exhib at Norwich, and for granting medals and diplomas of merit. From moment of its inception, the Prince of Wales and the Duke of Edinburgh a lively interest in furthering the project, and its happy execution was small degree owing to the assistance afforded by their Royal Highnesses.

The success attained at Norwich at once put in motion the enterprise o Northern neighbours. At the instance of the Highland and Agricult Society, Mr. Menzies paid a visit to the Norwich Exhibition, and his r was so favourable that the Scottish Society resolved upon following s the succeeding year. Amongst the objects especially noticed at Edinb was the Swedish collection of fish and fish-derived products, such as isin and gelatine. One young lady in particular exhibited a most ingenious beautiful set of brooches and ornaments made entirely of fish-scales. interest also was felt in the exhibits contributed by Professor Nordenskj of the fishing-tackle used by the tribes frequenting the borders of the Ar Ocean, and by the Esquimaux of the Port of Cloimu. Some valuable tributions to our knowledge upon points connected with these matters w obtained in the essays presented by various experienced writers, notably that contributed by Mr. George Sim upon the "Natural History of Herring," in an account of the "Harbour Accommodation of Scotland," gi by Mr. Young, Inspector of Salmon Fisheries, and in a disquisition upon different methods of Oyster Culture.

Meanwhile a movement was set on foot again under the auspices Mr. Birkbeck, for repeating, upon a grander scale in London, the experim

nirably initiated at Norwich. A very influential meeting, under the ency of the Marquis of Exeter, was held in the month of July 1881, at all of the Fishmongers' Company, when resolutions were adopted to the —That it was desirable to hold a Grand International Fisheries Exhibi- a London in the year 1883; that a communication should be addressed Members of Her Majesty's Government, informing them of the proposal, questing their kind co-operation; that a Committee should be requested w up, at the termination of the Exhibition, a Report on the Fisheries of ritish Empire and the best method of improving them; and that cor- ding Committees should be formed round the coast. The Chairmanship Executive Committee was accepted by Mr. Birkbeck, and a Committee alve was formed representing the various fishery interests of the United om. Canada gave the services of Sir Alexander Galt; and the Marquis milton, upon whom, in conjunction with Mr. Birkbeck, the onus of the ibility and the stress of the laborious daily executive work have fallen, ded to represent Ireland; while the Aquarium Department was placed the management of Sir James Gibson Maitland; and the construction building was confided to the care of General Scott, whose recent decease atly mourned at South Kensington. The buildings for the Exhibition, bly adapted as they are for their respective uses, bear no slight ny, were any needed, to General Scott's exceptional skill in architectural ction. Nor at the inauguration of this Great International enterprise colleagues fail to remember the high scientific attainments—the hness of purpose and the endearing sweetness of disposition of him labours are ended.

ond important meeting was held at Willis's Rooms in February 1882, the Duke of Richmond and Gordon read the Report of the Committee, ir Royal Highnesses the Prince of Wales and the Duke of Edinburgh ed a strong interest in the undertaking. The support of Royalty was adily granted for the scheme, Her Majesty graciously consenting to be and the Prince of Wales becoming President, while the Duke of rgh, the Duke of Connaught, the Duke of Albany, and the Duke of dge, accepted the position of Vice-Presidents, and the Duke of Richmond rdon that of Chairman of the General Committee. Of this Committee me Minister and Lord Granville are members, together with most of nisters of the present and late Administration. Every facility also was d by the various departments of the Government for forwarding the s of the Exhibition. Various means have been adopted to spread the public a knowledge of the subject connected with this industry. are offered for the best exhibits as well as for the best essays upon d and appropriate topics; Authorities of distinction have been invited mile a series of popular Shilling Handbooks upon subjects with which re specially acquainted, and Conferences are arranged to be held the continuance of the Exhibition for the discussion of important s, the first of which will be held on the 12th of June, when a paper ted by His Royal Highness the Duke of Edinburgh will be read. the practical side of the matter neglected. A fish market has been

established within the precincts of the building, to which the great sale of our principal ports will send their wares direct. Arrangements, too, been made for the supply of cheap fish dinners, under the able and experi direction of Mrs. Clarke, the Lady Superintendent of the National Sch Cookery, while lectures upon the treatment of fish will be given daily experienced instructress.

The sentiments animating the promoters will best be illustrated by o words spoken by the Prince of Wales at the inaugural banquet at Nor "It is particularly gratifying," said His Royal Highness, "to see that a an interest is being taken not only in our fisheries, but in our fish whose lives are so frequently exposed to risk through the severity of w and the dangerous character of the Eastern coast. Among a very inter display of specimens, I especially observed the apparatus for saving lif a variety of models of life-boats, which cannot fail to bring before the generally their duty in regard to the protection of the fishing interests country. Whilst thinking over the probable results that may atten Exhibition, I could not fail to reflect upon the labour it has cost more than one; and I do trust, having regard to the importance of our na fishing interest, and the value of our fishermen's lives, that a sort of Na Society may be instituted which will maintain those who are unfortunat want, and help to assuage the grief and misery of the widows and orph those who perish at sea. I believe it is only necessary to throw out th to see established in this country a National Fishermen's Aid Society, shall command the support not only of those living upon the line fishing coast here, but of all concerned in fishery throughout our dominio

In these pregnant sentences, well befitting the Heir of the British C are contained the whole force and design of the great Fisheries Exhib not merely as presented at Norwich, but as developed in its International in the present Exhibition at South Kensington. To this end the Exhibit Prizes, the Conferences, the Handbooks, the Market, the Cookery, the Di the Lectures, are all, in a systematic and carefully elaborated plan, moniously directed. It is much to defend the natural wealth of our river seas from the rapacity of greed and the recklessness of pollution; to pr improved harbour accommodation, and greater facilities for transport and merce; to render the meals of the million more palatable, more whole and, at the same time, more economical. But all these things sink insignificance when compared with the safe-guarding of our fishermen's and the improvement of our fishermen's homes. These are objects in w all nations can cordially co-operate because all mankind is interested in result; and in no way can our island kingdom more gracefully or benefic exercise the historic preeminence conceded to her upon the seas than promoting these interests in connection with such an enterprise as that of International Fisheries Exhibition.

*7 May*, 1883.

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Overall, S., Son, & Co., 102 Lower Thames Street, and 77 Wapping Wall, London; a
Peterhead, N.B.
Overton, Victoria Station
Owen, Mostyn
Oyster Merchants' Company
Pain, James, 1 St. Mary Axe, London, E.C.
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Patent Ferrule Company, Sheepcote Street, Birmingham
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Park, John, Fraserburgh, N.B.
Parker, H. C.
Parker, William, Chairman of the Board of Conservators of the Eden Fishery Dist
Carlton Hill, Penrith
Parrett, Forest Hill and Brockley
Partridge and Cooper, 192 Fleet Street, E.C.
Paterson, Alexander, 8 High Shore, Macduff, N.B.
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Paterson, George, 4 Market Street, Macduff, N.B.
Paterson, William, 5 High Shore, Macduff, N.B.
Patrick, Stephen Melton, 103 Westborough, Scarborough
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Peneau, Joseph, 6 Martin's Lane, Cannon Street, E.C.
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Peterkin, J. C. & Co., Lossiemouth, Elgin
Pezzack, William, Newlyn
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Phillips, Thomas, & Co., 8 John's Market, Liverpool
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Pickhardt, G., 45 Crogsland Road, London, N.W.
Pickwell, Robert, C.E., Bowlally Lane, Hull
Pilkington, W., 180 East India Dock Road, Poplar, London, E.
Pilley, William, Jun., & Co., Upper Highgate, Birmingham
Pintsch's Patent Lighting Company, Metropolitan Chambers, New Broad Street, E.C
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Piston Freezing Machine and Ice Company, 301 & 303 Oxford Street, W.
Plummer, Lewis, Mast Yard, Sandside, Scarborough
Pocock Bros., 235 Southwark Bridge Road, S.E.
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Portland, His Grace the Duke of, Welbeck Abbey, Worksop
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Praag, Alexander Van, & Son, 9 Crown Street, Soho, London, W.
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Smith, Thos. Jas., 10 and 11 North Church Side, Hull
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Steedman & McAlister, Cathcart Street, Glasgow
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Waythe, William E., Echline House, Princes Road, Gt. Yarmouth .....
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West, David W. .....
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Wheldon, John, 58 Great Queen Street, W.C. .....
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White, F. .....
Whitfield & Hakes, Commercial Road, Hull .....
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Wigley, William H., St. George's Road, Cheltenham .....
Wilkins, Frederic C. E., 55 Poland Street, London, W. .....
Wilkins, William, Queen's Road, Tunbridge Wells .....
Willans & Robinson, Ferry Works, Thames Ditton, Surrey .....
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Williams, A. H., 1 St. Mary's Road, Peckham .....
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Williams, William, Mousehole .....
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Wilson Engineering Company, Holborn, London .....
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Wilson, Henry, 32 Southside Street, Plymouth .....
Wilson, Peter, Office of the Fisheries, Girvan, Ayrshire .....
Wiseman, Frederick, Paglesham, Rochford, Essex .....
Witherwick, J., Hull .....
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Wood, John William, 34 Great St. Helen's, London, E.C. .....
Woodcock, J. P., 23 Abingdon Street, Westminster .....
Woodger, Henry Lamble, 9 Haddo Terrace, Scarborough, Yorks. .....
Woodger, Edward & Son .....
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Woodrow, A. .....
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*Woolfe, F. W.*, & Son, 46 Lower Shadwell, and Middle Shadwell, London, E. .....
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1029*a*. National Fish Culture Association
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## ANCIENT FISHING IMPLEMENTS, &c.


989. Galloway, William, Inveresk by Edinburgh


## ANTISEPTICS FOR PRESERVING FISH.


654. Antitropic Company (W. F. Grier & Co.) Glasgow; and 20 Stamford Street, Blackfriars, London, S.E.
651. Bumsted, D., & Company, 36 King William Street, London Bridge, E.C.
649. Corbet, John, M.P., Stoke Works, Worcestershire
650. Droitwich Salt Co., Limited, 8 & 9 Lower Thames Street, London, E.C.
654*a*. King, William, 1 New Road, Commercial Road, London
648. Renshaw, James, Northwich, Cheshire
653. Sanitas Company, Limited, Three Colts' Lane, Bethnal Green, London, E.
652. Yeomans, Matthews, & Co., Wincham, Northwich


## DISEASES OF FISH, MODELS, &c.—PHYSICO-CHEMICAL INVESTIGATIONS.


799. Rae, C. S., Allesley, Coventry


## DRIFT NETS AND SEINES.


14. Grimsby, Committee for
14*i*. Grimsby Coal, Salt and Tanning Co. (Limited), Fish Docks, Grimsby
26. Hounsell, Herbert E. (Limited), Bridport, Dorset
28. Hounsell, William, & Co., North Mills, Bridport


## EDIBLE; MODELS OF FISH-CURING ESTABLISHMENTS AND METHODS OF CURING, &c.—CURED FISH OF ALL KINDS.


576. Adie, Thomas M., & Sons, Voe, Shetland
551. Allen, Edward Ellis, 111 Cheyne Walk, Chelsea
633. Appleyard, J. F., 110A Waterloo Road, S.E.; 77 Bishop's Road
552*a*. Barron, R., Macduff, N.B.
563, 614. Barrow, George, 118 Lower Thames Street, London
618. Barrow, H., & Co., 24 Botolph Lane and Billingsgate
565. Bellis, Thomas Kerrison, 8 & 10 Jeffreys Square, St. Mary Axe, London, E.C.
570. 588. Blanchflower & Sons, Great Yarmouth, Norfolk
582. Boyle, J. S., Forfar, and Gourdon by Bervie, N.B.
577. Brand, H. W., 58 Charlwood Street, Pimlico
599. Bridgman, Cayley, and Boyes, 42 Poultry, E.C.
571. Burgess, John, & Son, 107 Strand, London
564. Bush, Mrs. Isaac, Alma Street, Wivenhoe, nr. Colchester, Essex
584. Calderwood, Robert, Greenock
601. Campbell, Robert, 13 Breadalbane Crescent, Pulteneytown, Wick, N.B.
646, 647*a*. Carr, W. G., and Son, 613 High Street, Berwick-on-Tweed
602*a*. Carr, Holmes, Sons & Co., Limited, Berwick-on-Tweed
599*a*. Chambers, Oldham & Willins, Bank Plain, Norwich
644. Cormack, Thos., & Sons, Eyemouth
572*c*. Cornish Sardine Company, Mevagissey
592. Crawford, A. O., Wick
568. Crosse and Blackwell, Soho Square, London, and Morrison's Quay, Cork
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638. Bertram & Roberts, Crystal Palace
839. Birmingham and Midland Piscatorial Association, 39 Vyse Street, Birmingham
943. Braine, F., Kensington
839*a*. Brighton Aquarium Company
840. Brookwell, H. G., 15 Belmont Villas, Leyton Road, Leyton
841. Brotherston, Andrew, Shedden Park Road, Kelso, N.B.
842. Brunton, John, M.A., M.D., 21 Euston Road, London, N.W.
842*a*. Budge, W. H., 1 Queen's Gate Place Mews, South Kensington
843. Bunn, Henry Howard, Palmerston House, Ventnor, Isle of Wight
948. Burton & Son, H. J., 191 Wardour Street, Oxford Street, London
844. Butler, Joseph, "True Waltonian Society," "White Horse," 80 Liverpool Road, N.
845. Callaghan, J., 36 St. Mary at Hill, Eastcheap.
846*a*. Campion, Robert, 3 Comber's Terrace, Brixham, Devon
847. Carr, Mrs. Walter Paterson, High Street, Berwick-on-Tweed
847*a*. Cartwright, W. C., 27 St. Mary Axe
847*b*. Chambers, George, 37 Fenchurch Street
624. Charles, J. S., 9 Grosvenor Place, S.W.
905. Cholmondeley-Pennell, H., 5 Cadogan Terrace, S.W.
848. Clifford, J. W., Three Colts, Cambridge Road, Bethnal Green
848*a*. Cobbold, Dr. Spencer T., 74 Portsdown Road, Maida Hill, N.W.
849. Coburn, F., 7 Holloway Head, Birmingham
849*a*. Coker, Jabez, Paragon Railway Station, Hull
850. Convivial Angling Society, "Bull and Bell," Ropemaker Street, Finsbury
851. Cresswell, Henry "True Waltonian Society," White Horse, Liverpool Road, Islington, N.
851*a*. Critchfield, A. C., 1 Pownall Road, Queen's Road, Dalston, London, E.
886*f*. Crowley, J. William, 20 Cloudesley Square
851*b*. Cullum, H. J., 10 Harley Street, Battersea
852. Curtis, E., Jun., Mortimer Lodge, Upton, Essex
854. Da Costa, Hyman, 18 Peter Street, Tyssen Street, Bethnal Green
620. Darnall, 123 Lower Thames Street, E.C.
855. Davie, John Hunter, 49 Shaftesbury Road, Hammersmith
853. Day, Dr. Francis, Kenilworth House, Cheltenham
856. Eastwood, G. J., Cheshunt, Herts.
932. Edinburgh, H.R.H. the Duke of, K.G., Clarence House, St. James's, London
857. Edwards, Henry, 100 High Street, Kingsland, London, E.
858. Eedle, Thomas, 40 Goldsmith Row, Hackney Road, London
859. Eiloart, E. G., 33 George Street, Hanover Square, W.
860. Ellis, John, Pritchard's Arms, Hackney Road
861. Erne Fisheries, Ballyshannon, County Donegal, Ireland
1030. Exeter, the most Honourable the Marquis of, Burghley Park, Stamford
886*c*. Featherstone R., Aldershot
941. Fitzgerald, Major Purefoy, North Hall, near Basingstoke
862. Foot, W., 21 Waterside North, Lincoln
864. Friendly Anglers' Society, The Albion, Albion Street, Hyde Park, London, W.
886*g*. Gant, J. W.
942. Gardner, James, 29 Oxford Street, London, W.
865. Gathercole, George, 112 Akerman Road, Brixton
867. Gedney, C. W., Bromley, Kent
866. George, Alfred, 2 Dempsey Street, Commercial Road, London, E.
990. Gerrard, Edward, Jun., 31 College Place, Camden Town
868. Gill, Alexander, Selwyn Road, High Cross Lane, Tottenham
869. Gillett, John, 40 Fetter Lane, Holborn
870. Good Intent Angling Society, The, Richard Murphy, Secretary, The Crown Inn, Church Street, Shoreditch
870*a*. Gordon, Lord Granville, 1 Queen Anne Street, London, W.
871. Goundrey, J., 109 High Street, Oxford
634. Gow
872. Gray, Henry, 55 Charlotte Street, Portland Place
873. Great Northern Brothers' Angling Society, 67 Southampton Street, Pentonville, N.
991. Gregory, James R., 88 Charlotte Street, Fitzroy Square, London
874. Gresham Angling Society, Masons' Hall Tavern, Masons' Avenue, Basinghall Street, E.C.
626. Grimsby Company
875. Gunn, E. W., Jun., 47 Upper Saint Giles Street, Norwich

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913. Sachs, Florence, 22 Hyde Park Place, London, W.
914. Sachs, Thomas Ransom, 22 Hyde Park Place, London, W.
886*b*. Sanders, S.
945. Scott, Harry, Forbes House, Surrey, 28 Belgrave Square, S.W.
916. Scott, J. R. Knowle, F.S.A., The Drive, Walthamstow
917. Searle, Edmund, William, 11 College Place, Great College Street, N.W.
917*a*. Silver Trout Angling Club, Star and Garter Hotel, St. Martin's Lane, W.C.
918. Smith, D., 16 Guildford Street, Wilmington Square, Clerkenwell
918*a*. Smith, E. H., 22 Strutton Ground, Westminster
919. Snowie, Hugh, & Sons, Church Street, Inverness
920. Society of Caxtonian Anglers, The, Falcon Hotel, Gough Square, Fleet Street
925. South London Angling Society
923. Stanley Anglers' Society, 51 Camden Park Road, N.W.; George E. Walker, Sec.
924. Starkey, James, 28 Albion Road, Stoke Newington
925*a*. Sweeting, J., & Co., 159 Cheapside, London, E.C.
926. Taplin, F., Wimbledon
927. Taylor, George Galloway, 11 Tranton Road, Jamaica Road, Bermondsey, S.E.
928. Taylor, Matthew, Cookridge Street, Leeds
928*a*. Teasdel, W., Harbour Works, Great Yarmouth
929. Toppin, Percy, Glan-yr-Afon, Strawberry Hill
929*a*. Traquair, R. H., 8 Dean Park Crescent, Edinburgh
930. Tremaine, William Henry, Windsor Castle Hotel, Hammersmith
931. United Society of Anglers (The), The "Wellington," Shoreditch, E.
933. Vale, J., 27 Hammersmith Road, London, W.
933*a*. Watkins, C., Woolwich Invicta Angling Club
946. Webb, John W., Captain R.N., Kongo House, Hythe
934. Webb, T. S., 56 Burton Street, Burton Crescent, London.
935. Webster, William George, 1 Bedford Court, Old North St., Red Lion Square,
936. Westbourne Park Piscatorial Society, "The Pelican," All Saints' Road, Westbo Park, W.; H. Thompson, Secretary
935*a*. West, David W.
934*a*. Whale, J., 74 Leadenhall Street, E.C.
936*a*. White, F.
737. Williams, F. T. & Co., Great Queen Street, London
938. Woodman, G., 60 Camberwell New Road
938*a*. Woodrow, A.
939. Wright, Robert, The Willows, Harlesden, Middlesex
940. Wynn, Sir Watkin W., Bart., M.P., Wynnstay, Ruabon

## FISH CULTURE.

744, 786. Andrews, Thomas, Westgate House, Guildford
764, 784. Armistead, Joseph John, Solway Fishery, Dumfries, N.B.
738. Atkins Water Softening Co., Bouverie Street, Strand
771. Austen, A.
760. Bapty, Samuel Lee, 65 Blackheath Road, Greenwich, Kent
779. Berney, George Duckett, Morton Hall, Norwich
756. Bolton, Thomas, Naturalist, 57 Newhall Street, Birmingham
748*c*. Brazier, Albert, Southwick, Brighton, Sussex
749. Cail, Richard, Newcastle-on-Tyne
744*a*, 787. Capel, Charles Cecil, Cray Fishery, Foots Cray, Kent
745, 752. Chambers, W. Oldham, F.L.S., Lowestoft
759. Clark, John, 17 Royal Exchange Square, Glasgow
765. Corbigny, H. de, Auray, Morbihan
732. Cornilleau, L., Mons., La Trinite sur Mer, Morbihan
748. Curtin, Fergus, Mucknish Castle, Burren Oranmore, Ireland
775. Dilnot, G., Hayling North, Havant, Hants
737. Edan et Jardin, Auray, Morbihan
755*a*. Edinburgh Museum of Science and Art, Edinburgh; Prof. T. C. Archer, Dir
776, 781. Erne Fisheries, Ballyshannon, co. Donegal, Ireland
743, 750, 800. Exeter, The Most Honourable Marquis of, Burghley House, Stamford
756*a*. Fisheries Preservation Association, per R. A. Kinloch, Secretary, 17 Seym Street, Portman Square, W.

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134. Dockar, Alexander, Garmouth, by Lochaber, N.B.
165. Donaldson, Robert, 5 Quay, Dumbarton, N.B.
155. Earl's Shipbuilding and Engineering Company, Limited, Hull
209. Edgington, Benjamin, 2 Duke Street, London Bridge, London, S.E.
135. Edinburgh, H.R.H. the Duke of, K.G.
225*ab*. Edinburgh Roperie and Sailcloth Co., Bath Street, Leith, and Denisto
Glasgow, per James Pringle, Managing Partner
363. Emery, Lewis, Sherringham, Norwich
191. Fairbrass, Herbert Wynne, Canterbury
145. Findlay, George, Whitehills, Banff
127. Fellows, H., & Son, Great Yarmouth
193. Fleet, Dartmouth
103. Forrestt & Son, Norway Yard, Limehouse, London
198. Frost, Brothers, 11 London Street, E.C., and at Shadwell
158. Garrood, Charles, South Lodge, Forest Hill, London, S.E.
32*ac*. Geard, Mrs., Newlyn
84*a*. Gearing, Arthur, 12 Warrington Street, N.W.
32*am*. Gibson, J., Photographer, Penzance
Green, Joseph, The Docks, Lerwick, Shetland
Graves, Henry, Boadbuilder, Peel, Isle of Man
91. Griffiths, Robert, 54 Gresham Street, E.C.
225*a*. Grimsby Coal, Salt and Tanning Company
182. Gulston, G. S., Marston Lodge, Cheltenham
131. Gunn, John, The Hermitage, Golspie, N.B.
180. Gurr, John, 5 Egbert Street, St. George's Road, Regent's Park, N.W
32*ag*. Haly, E., Falmouth
104. Hamilton, Daniel, Upper Main Street, Dunbar, N.B.
117. Hamilton, Marquis of, 2 Belgrave Square, S.W.
Harrison, Richard, Port St. Mary, Isle of Man
205. Hawkins & Tipson, 52 & 53 Crutched Friars, London, E.C., and Glob
Milwa'l, E.
81. Hawthorn & Co., Leith, N.B.
220. Hayward, Richard, & Co., Coker Sailcloth Works, Crewkerne, Son
93 Minories, London, E.
219. Hayward, Richard, & Sons, West Chinnock and Tail Mill, Somerset
99. Hoad, James C., Jun., Rye, Sussex
08. Hodgson, J. W., 48 Redbourne Street, Hull

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170. Teasdel, William, C.E., Harbour Works, Great Yarmouth, Norfolk.....
199. Thomson, M. C., 67 Great Clyde Street, Glasgow, and 18A Basinghall S London .....
Tudor, John R., 5 Magdalen Road, St. Leonards .....
137. Tyzack, B. C., 13 Preston Road, North Shields .....
102. Unite, John, 291 Edgware Road, London, W. .....
143. Upham, T. W. and A., Brixham, Devon .....
152. Wales, H.R.H. the Princess of.....
142. Wallis, Whitworth, 4 The Residences, South Kensington Museum, London, S
32*a*. Wallis, W., Newlyn .....
81*a*. Ward, T. Wilson, St. Margaret's College, Lowestoft .....
188. Ward, Rowland, & Co., Naturalists, 166 Piccadilly, London.....
200. Warrington Wire Rope Works, Limited, 13 Goree Plazza, Liverpool; and rington.....
163. Watson, John, 29 North Portland Street, Glasgow.....
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148. Weatherhead, James, Eyemouth, Berwickshire .....
203. Webster, Francis & Sons, Alma Works, Arbroath .....
Whetham, S. & Sons, 40 Gracechurch Street, London, E.C., and Bridport, D
162. Wilkins, Frederic, 55 Poland Street, London, W. .....
126. Wiseman, Frederick, Paglesham, Rochford, Essex.....
149. Wilson, Peter, Offices of the Fisheries, Girvan, Ayrshire, Scotland .....
32*ae*. Williams, William, Mousehole.....
168. Witherwick, J., Hull .....
177. Woodcock, J. P., 23 Abingdon Street, Westminster.....
95. Woodger, Henry Lamble, 9 Haddo Terrace, Scarborough, Yorkshire .....
122. Wright, J. P., 3 Park Road, Red Hill, Surrey .....
105. Young, Sir Allen, 5 St. James' Street, S.W. .....

## INVERTEBRATES.

764. Armistead Joseph J., Solway Fishery, Dumfries, N.B. .....
771. Austen, A. .....
816. Baylis, Wm. H., 35 Maiden Lane, Covent Garden, W.C. .....
804. Bolton, Thomas, 57 New Hall Street, Birmingham .....
810. Brassey, Lady, Normanhurst Court, Battle, Sussex .....
811. Brazenor, Charles, 39 Lewes Road, Brighton .....
817. Brazier, Albert, Southwick, Brighton, Sussex .....
805. Brotherston, Andrew, Shedden Park Road, Kelso .....
812. Burroughs, Lieut.-Gen. F. W. Traill, C.B., Rousay, Orkney, N.B. .....
831. Carrington, J. T., F.L.S., Royal Aquarium, Westminster .....
814. Clark, John, 17 Royal Exchange Square, Glasgow .....
765. Corbigny, H. de, Auray, Morbihan.....
806. Cook, James, 3 Moss Street, Paisley, N.B. .....
815*a*. Dohrn, Dr., Naples.....
808. Drake, J., 37 Burghley Road, Highgate Road, N. .....
816*a*. Edinburgh, H.R.H. the Duke of, K.G., Clarence House, St. James's, London
825. Eedle, J., 40 Goldsmith Row, Hackney Road, London .....
818. Findlay, George, Whitehills, Banff.....
823. Franck, S. M., 55 St. Mary Axe, London, E.C. .....
809*a*. Gardner, Miss (the collection of the late Mrs. Gardner) .....
808*a*, 823*a*, 823*b*, 826*a* Henry Lee, Margate.....
819, 827. Laughrin, William, Polperro, Cornwall .....
820. Lovell, Matilda Sophie, Calke Abbey, Derby .....
828. Lovett, Edward, 55 George Street, Croydon.....
824. McIntosh, Prof., M.D., LL.D., F.R.S., University St. Andrews, and Murthly
821. McLachlan, W. B., 21 McDowell Street, Edinburgh .....
829. Poland Brothers, Billingsgate .....
809. Rapp, L. F., 4 Grove Place, West End, Hammersmith London .....
830. Sayer & Co., 100 Lower Thames Street and Billingsgate, London .....
821*a*. Smith, W. Anderson, Benderloch, N.B.....
826. Thomson, John, 1 Main Street, Inverallochy, Fraserburgh, N.B.....
814*a*. Tudor, John R., St. Leonards-on-Sea.....
807. Whitstable Company of Free Fishers and Dredgers, in the County of Kent, known as "*Whitstable* Oyster Company," Thomas G. Browning, Clerk, Whitstable

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373. Steedman & McAlister, Cathcart Street, Glasgow
355a. Sugden, Lieut. S. S., R.N., Woodford, Essex
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347. Teasdel, William, C.E., Harbour Works, Great Yarmouth
368. Timmis, Illius Augustus, 17 Great George Street, Westminster, S.W.
409. Tipping, H. G. I., R.N.
391. Trinity House, Elder Brethren of, Tower Hill, London
375. Ward, Alfred, Kilburn Baths, Kilburn, London, N.W.
384. Waythe, William E., Echline House, Princes Road, Great Yarmouth
353. Wentworth, Messrs., 12 Museum Street, London, W.C.
374. Wilkins, William, Queen's Road, Tunbridge Wells
365. Williams, A. H., 1 St. Mary's Road, Peckham, London
379. Wood, John William, 34 Great St. Helens, London, E.C.
387. Woolfe, F. W., & Son, 46 Lower Shadwell, & Middle Shadwell, London, E.
372. Workshop for the Blind of Kent
386. Wright, James, 15 Jamaica Road, Bermondsey, London, S.E.
338. Young, Lambton, C.E., 16 Harcourt Terrace, Redcliffe Square, London, S.W.

## MACHINERY, &c..

718. Abbott, J. & Co., Newark-on-Trent
726a. Atkins, Chas., & Nisbet, 1 Water Lane, Great Tower Street, E.C.
696. Barton, C. E., Providence Works, 56 & 58 Eastgate, Great Grimsby
701. Bateman, O. H., & Co., Limited, East Greenwich, London
709. Beck, J., & Co., 130 Great Suffolk Street, Southwark, S.E.
705. Bell-Coleman Refrigerating Company, 45 West Nile Street, Glasgow
699. Brooke, J. W., Adrian Iron Works, Lowestoft
715, 723. Clark, Bunnett, & Co., Limited, 4½ Rathbone Place, London, W.
698. Clowes & Sons, Limited, Duke Street, Stamford Street, S.E.
694a. Davey, Paxman & Co., Colchester
714. Davis & Co., 24 Moorgate Street, London, E.C.
703. Dodman, Alfred, Highgate Foundry, King's Lynn
712a. Duncan Brothers, Engineers, 32 Queen Victoria Street, London, E.C.
700. Gilding & Silvering Company, 89 Edgware Road, London, W.
695 Hall, J. & E., 23 St. Swithin's Lane, E.C., and Dartford Iron Works, Kent.
713. Haslam Foundry & Engineering Company, Limited, Union Foundry, Derby
702. Hindley, Edward, Bourton, Dorset
711. Jones, F. & Co.
710. Keymer, H. J. C., The Fisheries' Iron Works, Great Yarmouth
694b. Kingsford Courtney, Lea Chemical Works, Victoria Park, London, E.
717. Mitchell & Son, Kirkcaldy, N.B.
697. Piston Freezing Machine and Ice Company, 301 & 303 Oxford Street, W.
722. Priestman, Bros., 52 Queen Victoria Street, and Hull
706. Ransome, Allen & Co., King's Road, Chelsea
712. Rose, Downs & Thompson, Old Foundry, Hull; and Kingston Works, Grim
704. Ruston, Proctor & Co., Lincoln
719. Shields, John & Co., Wallace Works, Perth
720. Siddeley & Co., 14 Upper William Street, Liverpool
716. Siebe, Gorman & Co., 187 Westminster Bridge Road, London; and Neptune W Mason Street, Lambeth
724. Swansea Waggon Company, Swansea
701a. Temple, Captain E., 51 Queen Victoria Street
725. Thomas, E. C. G., National Club, Whitehall, London
726. Turner Gas Engine Company, St. Albans
713a. United Asbestos Company, 161 Queen Victoria Street, E.C.
708. Vulcan Iron Works Company, Scott Street, Hull
707. Willans & Robinson, Ferry Works, Thames Ditton, Surrey
721. Woolf, Yeatman & Co., 119 New Bond Street

## MAMMALS, BIRDS, AND REPTILES.

954c. Amherst, Mrs. Margaret, 88 Brook Street, Grosvenor Square, W.
955, 973. Ashmead, G. B., & Co. (Naturalists), 35 Bishopsgate Street, London, E.C.
836. Bartlett, A. D., & Son, Zoological Gardens, Regent's Park, N.W.
950. Brighton Aquarium Company
957. Burroughs, Lieut.-Gen. F. W. Traill, C.B., Rousay, Orkney, N.B.
948, 953, 969. Burton & Son, H. J., 191 Wardour Street, Oxford Street, London

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549*b*. Shipwrecked Fishermen's and Mariners' Royal Benevolent Society, Hibern Chambers, London Bridge

1045. Shipwrecked Mariners' Club

530. Siebe, Gorman & Co., 147 Westminster Bridge Road, S.E.

549*c*. Thames Church Mission to Seamen, Fishermen, &c., 31 New Bridge Street, L gate Circus

32*ba*. Thomas, J., Land's End

523. Tippitt, Son, & Co., Plymouth

230. Unite, John, 291 & 293 Edgware Road, London, W.

532. Walker & Harrison, Phœnix Biscuit Works, Ratcliff Cross, London, E.

531*c*. Whiting, H. G., 11 Poultry Chambers, Cheapside, London, E.C.

527. Wentworth, Messrs., 12 Museum Street, London, W.C.

1036. Willesden Paper Company's Fisherman's Cottage

526. Wilson, William, Albert House, High Street, Berwick-on-Tweed

306*a*. Wilson Engineering Company, Holborn, London

## PICTURES. (*See also Fine Art Section.*)

846. Campbell, Lord Colin, 79, Cadogan Place, S.W.

994*c*. Gun, T. E., 47 St. Giles Street, Norwich

1043. London Stereoscopic Company

537. Marchant, Mrs. H., 29 Tabor Grove, New Wimbledon

33*al*. Orchard, William, St. Austell

## PURIFICATION OF STREAMS.

797. Manufacturers' and Millowners' Mutual Aid Association, 5 The Sanct Westminster, London, S.W.

798. Native Guano Company, Limited, Sewage Works, Aylesbury

## REPORTS, STATISTICS AND LITERATURE.

1003. Arnold, John William, 9 Park Street, Deal

1004. Barnett, James, Kirkwall, Orkney

1005. Bates, W., Publisher, "Land and Water," 176 Fleet Street, E.C.

1028*a*. Berney, George Duckett, Morton Hall, Norwich

1006. Capel, Charles Cecil, Cray Fishery, Foot's Cray, Kent

994. De Caux, J. M., Great Yarmouth

1022. Cholmondeley-Pennell, H., 5 Cadogan Terrace, S.W.

982. Day, Dr. Francis, Leamington House, Cheltenham

1007. Exeter, Marquis of, Burghley House, Stamford

994*a*. Faber, G. L., Her Britannic Majesty's Consulate, Fiume. Bernard Quarit Piccadilly, London

1008. Fishery Board for Scotland, Edinburgh

1009. Forster, D. & W. H., Ashbourn, Derbyshire

Fryer, C. E., Home Office, S.W.

Gibbs, Miss Florence M.

1010. Gresham Angling Society, Mason's Hall Tavern, Mason's Avenue, Basin Street, E.C.

1012. Harding, Charles W., Assoc. M. Inst. C.E., King's Lynn, Norfolk

1013. Holdsworth, E. W. H., 40 Pall Mall, London, S.W.

984. Houghton, Rev. William, M.A., F.L.S., Preston Rectory, Wellington, Shr

1015. Inspectors of Irish Fisheries, Dublin Castle, Dublin

1016. Knowles, James, Cambridge

985. Laughrin, William, Polperro, Cornwall

1017. Lovell, Matilda Sophia, Catke Abbey, Derby

1023. Low, Sampson, Marston & Co., Publishers, 188 Fleet Street, London

1019. Mackenzie, W., 69 Ludgate Hill, London, E.C.

996. Newton & Eskell, High Holborn

995. Olsen, O. T., Fish Dock Road, Grimsby

1020. Olsen, T., Fish Dock Road, Grimsby

996*a*. Price, P. E. B.

986. Quaritch, Bernard, 15 Piccadilly, London

1024. Satchell, W., 19 Tavistock Street, Covent Garden, London, W.C.

1025. Smith, John, Beighton House, Winchester Road, Kilburn

997. Snowdon, J. P., 59 Queen's Road, St. John's Wood, London

1026. Trent Conservators' Board

1027. Tulloch, C., 12 Rodolph Road, Maida Hill, W.

1. Wheldon, John, 58 Great Queen Street, W.C.

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485. Howarth, Samuel, 184 & 185 Station Street, Burton-on-Trent
516*e*. Hutchinson, A., & Co., London, Paris, Germany
484. Hyde, W. Derby, Witney, Oxon
505*a*. Kelson, George M., Colville Mansions, London, W.
428. Little, G., & Co., 15 Fetter Lane, London, E.C.
468. McCarthy, Thomas, William Street, Cashel, co. Tipperary, Ireland
423. McCreadie, G., Fort House, Ayr, N.B.
478. Macnee, James, Loch Tummel Side, Pitlochry, Perthshire
471. Malloch, P. D., 209 High Street, Perth
490. Martin, John William, 4 Northern Buildings, Lover's Lane, Newark-on-Tre
446. Milne, William, 32 Back Wynd, Union Street, Aberdeen
430. Millward, Henry, & Sons, Washford Mills, Redditch
424. Noble, James, Wick, N.B.
452. Ogden and Scotford, 7 Portland Terrace, Pittville, Cheltenham
505*f*. Owen, Mostyn
466. Patrick, Stephen Melton, 15 and 16 Bar Street, Scarborough
486. Praag, Alexander van, & Son, 9 Crown Street, Soho, London, W.
459. Prichard, Erasmus B. P., Noyadd House, Llangorse, Talgarth
431. Prickman, E. F., 12 North Street, Exeter
435. Ramsbottom, R., 81 Market Street, Manchester
474. Redpath & Co., Tweedside Works, Kelso, N.B.
438. Ridley, W. Wells, Holmewood, Kenilworth
487. Robbins, John, Latimer Place, Latimer Street, South Birmingham
439. Roberts, Samuel, Llangollen, N. Wales
505*b*. Robertson, William, Central Arcade, Hope Street, Glasgow
453. Rogan, Michael, Ballyshannon, co. Donegal
450. Royston, Robert Richard, 10 King Street, Cambridge
419*a*. Severn Fisheries Board: Willis Bund, Hon. Sec.
504. Sheffield Manufacturers' Collection, per M. Hunter, junior, Mayor of Sheff
505*c*. Skene & Goodbrand, Mounthooly Ropework, Aberdeen
463. Slater, D., 9 and 10 Portland Street, Newark-on-Trent
434. Smith, Ogden, 4 Stanley Terrace, St. John's Hill, Clapham Junction
441. Toppin, Percy, Glan-yr-Afon, Strawberry Hill
444. Trickett, John, 16 Bennett Street, High Fields, Sheffield
505. Valentine, George, 77 High Street, Perth
425. Vokins, William, 1 Porchester Terrace, Hyde Park, W.
437*a*. Vowles, S. T., King's Mill Road, Milton, Sittingbourne
464. Watson, W., & Sons, 308 and 313 High Holborn, London, W.C.
436. Wigley, William H., St. George's Road, Cheltenham
448. Williams, F. T. & Co., 10 Great Queen Street, London, W.C.
433. Wright, James, Sprouston, near Kelso, Roxburghshire, Scotland

## SIGNALLING, ELECTRIC LIGHT, SUBMARINE CA &c. PROTECTION OF CABLES, &c.

259*a*. Adams, W. N., 23 Percy Circus, W.C.
414. Bapty, S. S., 7 Royal Circus Street, Greenwich
276. Beck & Co., Limited, 130 Great Suffolk Street, Southwark
279. Bodill, Parker & Co., Great Hampton Row, Birmingham
245. Bowman, James, 22 Square, Huntly, Aberdeenshire
250. Bryer & Sons, 104, Minories, E.C.
272. Cator, R. P., Rear Admiral, Langley Farm, Beckenham, Kent
283*a*. Chadburn & Son, 96 Fenchurch Street, E.C., and 71-73, Lord Street, Live
303. Cornwall, Committee for
269. Day, William, & Co., Blackheath, London, S.E.
290. Dollond & Co., St. Paul's Churchyard, London, E.C.
305. Drew & Cadman, 245 and 246, High Holborn
251. Edgington, Benjamin, 2 Duke Street, London Bridge
306*c*. Electrical Fuze and Sound Signal Co., 70 Bishopsgate Street Within, E.C.
233*a*. Electric Motor Syndicate, Limited, Callow & Eck's Patent, 3 Copthall Bui Bank, E.C.
226*a*. Gage, Thomas, 53 Tyndall Street, Brixton
281. Greenway, Clive, Vale & Co., The People's Hall Works, Birmingham
288. Gregory, James, Portland Works, Lincoln
306*e*. Grimsby Coal Salt and Tanning Company
241. Hall, Dunbar & Co., St. Ninian's Colour Works, Leith

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306*c*. Electrical Fuze and Sound Signal Company, 70 Bishopsgate Street Within, E.C.
229. Fox, Capt. H. C., Royal Thames Yacht Club
302. Fraser, A. B., & Co., 6 New Quay, Liverpool
226*a*. Gage, Thomas, 53 Tyndall Street, Brixton
281. Greenway, Clive, Vale & Co., The People's Hall Works, Birmingham
288. Gregory, James, Portland Works, Lincoln
254. Griffiths, Burdoe, & Co., the Sanitary Paint Company, Limited, 34 Leadenhall Street, London, E.C.
306*e*. Grimsby Coal Salt and Tanning Company
241. Hall, Dunbar & Co., St. Ninian's Colour Works, Leith, N.B.
252. Harvie, W., & Co., Broomielaw, Glasgow
263. Haslett & Thompson, 122 Southampton Row, London
32*at*. Hayne, James, Port Isaac
32*o*. Hazeland, S. S. Fowey
289. Heath & Co., Limited, 28 Fenchurch Street, London, E.C.
237. Heathorn, Capt., T. B., R. A., 10, Wilton Place, Knightsbridge, London
244. Heron, Thomas, Pump Street Works, London Road, Manchester
32*ar*. Hewitt, Sir Harold, Bart., Salcombe, Devon
270. Hubbuck, Thomas, & Son, 24 Lime Street, London
227. Hughes, Henry & Son, 49, Fenchurch Street, London
240*a*. Hutchinson, A., & Co., 3 and 4 Great Winchester Street, London, E.C.
233. Ihlee & Horne, 31 Aldermanbury, London
267. Indestructible Paint Company, 27 Cannon Street, E.C.
236. Kite, C. & Co., Christopher Works, Chalton Street, London, N.W.
395. Lacey, R. G., 4 Goulden Street, Battersea, S.W.
246. Lafargue, Alphonse, Palace Chambers, 9 Bridge Street, Westminster, S.W.
226. Lamb, J. M., & Co., 119 Finsbury Road, E.C.
278. Lancaster, Charles, 151 New Bond Street, W.
296. Leeman, Joseph, Aberdeen
306. Liardet, John Evelyn, 14 Fenchurch Street, London, E.C.
306*d*. Liardet, Leslie, 14 Fenchurch Street, London, E.C.
258. Lucas, Joseph, & Son, Little King Street, Birmingham
303*a*. Mackenzie, Capt. H. Somerset, R.N., 4 Great St. Helens, E.C.
258*a*. McLennan & Owen, 84 Finsbury Park Road
285. Massey, J. Edward, 17 Shadwell Street, Clerkenwell, London, E.C.
304. Morrison, William, & Sons, Jane Street, Leith
278*a*. Needham, Alfred J., 14 The Terrace, Hammersmith
228. Negretti & Zambra, Holborn Viaduct, E.C.
265. Noble, Alexander, late Seaman, 55 Hanover Street, Fraserburgh, Aberdeenshire
282. Nunn, William, & Co., Neptune Works, 204, 205, & 206, St. George Street, London, E.
231. Olsen, O. T., Fish Dock Road, Grimsby
294. Pain, James, 1 St. Mary Axe, London, E.C., Works, Mitcham, Surrey
282*a*. Partridge and Cooper, 192 Fleet Street, E.C.
243. Patent Ferrule Company, Sheepcote Street, Birmingham
301. Peacock & Buchan, Southampton and London
397. Penhey, William H., 4 Sherland Villas, Twickenham
295. Pickwell, Robert, Bowlally Lane, Hull
242. Pilley, William, Jun., & Co., Upper Highgate, Birmingham
320*b*. Roberts, Henry, Mevagissey
266. Rollo, James, Mason, Fraserburgh, N.B.
240. Rudd, W. H., Queen's Road, Great Yarmouth
273. Sax, Julius, 108, Great Russell Street, Bloomsbury, London, W.C.
415. Schreiber, Carl G. von, St. Margaret's College, Lowestoft
1044. Siebe, Gorman & Co.
Smith, W., & Sons, Newmill Iron Works, Elgin, N.B.
271. Stavers, G., The Jerusalem Exchange, Cornhill, London, E.C.
256. Steele, Henry, Schoolhill, Macduff, N.B.
300*a*. Steven Brothers & Company, 35 Upper Thames Street, London
414*a*. Telegraph Construction and Maintenance Company, 38 Old Broad Street, London
292. Thomas, E. C. G., National Club, Whitehall Gardens
259. Trotter, John, & Co., 7 Great Winchester Street Buildings, London, E.C.
*1032*. United Asbestos Company, 161 Queen Victoria Street, E.C.
*291*. Utley, Thomas, 79 Cameron Street, off Needham Road, Liverpool
*280*. Walker, Thomas, & Son, 58 Oxford Street, Birmingham

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16. Edinburgh Roperie & Sailcloth Company, Bath Street, Leith, and Denn Ropework, Glasgow
35. Findlay, George, Whitehills, Banff, Scotland
36. Flett, James, Queen Street, Branderburgh, Morayshire
4. Folkestone, Mayor of
52. Fordyce, John, Gardenstown, Banffshire
10. Fowler, William, Rose Street, Peterhead
32*i*. George, J. B., St. Mawes
58*c*. Gerhard, Haas, Cleve, Germany
14*g*. Grimsby Coal Salt and Tanning Company, Limited, Fish Docks, Great Gri
14. Grimsby, Committee for
15. Hearder & Son, 195 Union Street, Plymouth
49. Hemming, T., & Son, Windsor Mills, Redditch
9. Henry, Alexander, 12 South Saint Andrew Street, Edinburgh
32*n*. Hills & Honey, Port Isaac
26. Hounsell, Herbert E., Limited, Pelican Twine and Net Works, Bridport, D
28. Hounsell, William & Co., North Mills, Bridport
32*d*. Humphreys, William, Newlyn
33. Irving, William, Loch Fishery, Annan, N.B.
32*a*. James, C. J., Newlyn
58. Jones, Captain A. J., 2 Sandown Terrace, Chester
51. Jones, John, Queen Street, Filey, Yorks
30. Jones, W., 10 Eastbro, Scarborough
32*c*. Kitchen, H. F., Newlyn
32*h*. Kitto & Sons, Porthleven
2. Knowles & Knowles, Zebu Works, Southcoates, Hull
18. Lacey, Linch, & Son, 3 Goulden Street, Battersea
32*q*. Laughrin, William, Polperro
58*a*. Lee, Henry, Margate
47. Leslie, John, Ropeworks, Macduff
53. Linton, Andrew, 87 High Street, Edinburgh
31. Mackay, Andrew, 8 Crook o' Ness Street, Macduff, N.B.
14*a*. McIntosh, Harold Blyth, 98 Kent Street, Great Grimsby
11. Matheson, Murdo, Scornie, N.B.
32*b*. Murrish, J., Newlyn
32*j*. Nautilus Club, Penzance
6. Norris, C. W., Harbour View, Lowestoft
12. Osborne, Charles, & Co., 13 Whittall Street, Birmingham
46*a*. Paterson, Alexander, 8 High Shore, Macduff, N.B.
46. Paterson, Andrew, 6 High Shore, Macduff, N.B.
19. Paterson, William, 5 High Shore, Macduff, N.B.
32*k*. Rashleigh, E. W., Kilmarth, Par
34. Read, George, Byrom House, St. Patrick's Road, Deal, Kent
32*e*. Richards, Hy., Mousehole
45. Richardson and Fletcher, 5 Beresford Place, Dublin
40. Schreiber, Carl G. von, St. Margaret's College, Lowestoft
1048. Severn Fishery Board. J. W. Willis Bund, Chairman
57. Sharp & Murray, Collardyke, Fifeshire
38. Shepherd, H. C. W., Hull House, Raglan Street, Lowestoft
44. Speedie, Alexander
56. Steedman & McAllister, Catheart Street, Glasgow
24. Strachan, William
54. Stuart-Wortley, Colonel, Rosslyn House, Grove End Road, and Patent M South Kensington
21. Tarry Mill Company, Tarry Mill, by Arbroath, N.B.
48. Thompson, Hartley, Girvan, Ayrshire
42. Thompson, Peter, 9 High Shore, Macduff, N.B.
58*b*. Whetham, S. & Sons, 40 Gracechurch Street, London, E.C.
5. "Willesden" Waterproof Paper and Canvas Company, Limited, Will Junction, N.W.
37. Wilson, Henry, 32 Southside Street, Plymouth

# COMPLIMENTARY LIST.

**e Executive Committee is indebted to the following Firms for Special Services rendered; and for the Exhibits specified below, which have been courteously lent for the use of the Executive at the installation of the Exhibition, and throughout its term.**

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**EOLUS WATERSPRAY AND GENERAL VENTILATING MPANY, Limited,** 235 High Holborn. The Æolus Ventilators are in use in the Fish ing Room, the Lecture Theatre, the South Wing, the Board Room and the Secretarial ces.

**ATKINS WATER SOFTENING AND PURIFYING COMPANY,** Fleet Street, London, E.C. Apparatus for softening and purifying from 500 to 2000 gallons ater per hour, consisting of four parts, namely: 1st. Lime cylinder for the continual and omatic formation of lime water. 2nd. Patent mixer for mixing hard water supply and water. 3rd. Cistern in which softening process takes place. 4th. Patent Rotary disc er. The especial points of this arrangement are perfectly uniform results and speed of ning filter by merely turning a handle or a pulley for a few minutes.

**BARNARD, BISHOP & BARNARDS,** Norwich; 91, 93, 95 Queen toria Street, London, E.C. (1) Ornamental cast-iron garden chairs; wrought-iron chairs wood chairs suitable for conservatories, gardens, public and private buildings, exhibitions, way platforms, &c. (2) Patented aquaria (exhibited on the stand of the Aylesbury Guano pany), and crab and lobster gauges (exhibited on the stand of S. W. T. J. Mann).

**BIRT, J. & A. W.,** Dock Street, London Docks, London, and Malaga, in. The Virgin Cork (over 100 bales) used in the various decorations at this Exhibition. ssrs. J. and A. W. Birt's cork forests are in the province of Malaga, in Spain.

**BOULT, BROTHERS & CO.,** 38 King William Street, London, E.C. o of Bird's patent "automatic" light-feed lubricators on the Davey Paxman horizontal ine indicating.

**BRIGHTON AQUARIUM COMPANY,** per J. Wilkinson, Manager Secretary, Brighton. In addition to placing seven of their tanks at the service of the hibition for receiving the deep-sea fish and crustacea from the trawler working for the hibition Stocking Committee, have presented Sea Anemones, including Actinoloba, Dian-a, Sagartia bellis, S. troglodytes, S. nivea, S. venusta, S. sphyrodeta, S. rosea, S. parasitica, miniata, Anthea cerus, Tealia crassicornis, Bunodes gemmacea, Corynactis, Serpulæ, Sabella, ilrepores, Algæ.

**BUSSELL, CHARLES, GIBBS & CO.,** 75 & 76 Wells Street, Oxford et, W. (1) 3 Bell Glass Aquariums, 18 in. diam. (2) 6 Ditto, 17 in. diam. (3) 1 Ditto, in. diam. (4) 2 Ditto, 15 in. diam. (5) 5 Ditto, 14 in. diam. With stands.

**CAREY, HENRY WILLIAM,** 9 London Street, London, E.C. Brewer's nt Anti-friction Pulley-Blocks, Cranes, &c. &c., supplied to the "P. & O. Co," "Orient," onald Currie," "Ducal" and other leading lines of steamers, dock companies, Royal Agri-tural Society of England, &c. Mr. H. W. Carey, of 9 London Street, City, sole agent for above, rendered the Executive Committee most valuable assistance in the reception of s into the building by the loan of these patent blocks, when the advantages obtained by labour-saving and other properties, and easy working was practically demonstrated to atisfaction of all concerned.

**CHUBB & SON'S LOCK AND SAFE COMPANY, Limited,** 128 en Victoria Street, London. One of Chubb's patent Fire and Thief-resisting Safes, size 6 in. high by 4 ft. wide by 2 ft. 2 in. deep, on wheel mounts, fitted with all the recent rovements of the Company, solid tee frame and solid flange lock case and gunpowder-proof s. Weight more than a ton and a half.

**CLOWES, WILLIAM, & SONS,** Limited, Duke Street, Stamford et, London, S.E. Printing Press, Compositors' Room, and services of staff of printers to ertake, in the Exhibition Buildings, printing for the Executive Committee, and for the ign and Colonial Commissions.

**COALBROOKDALE COMPANY, THE,** 43 & 44 Holborn Viaduct, don, E.C. A Collection of Cast iron Garden Embellishments and Horticultural Decora-s, consisting *of: (1) A large Fountain,* surrounded by four Naiads, situated in the Main

Hall, at the Exhibition Road end. (2) A number of Vases and Pedestals. (3) A number of Garden Seats and Benches in the building and grounds. All of which are the Committee, and will be for sale at the close of the Exhibition.

**CROSSE & BLACKWELL,** Soho Square, London. Fish Sauces, diments, &c., for use in the Practical School of Fishery and Cheap Fish Restaurant.

**CROSSLEY BROTHERS,** 24 Poultry, E.C. Gas Engines lent f of the tanks and aquaria.

**DAVEY, PAXMAN, & CO.,** Engineers, Colchester. The sup engine and boiler power necessary for working the vast system of electric lighting the the whole area of the Exhibition has been provided by Messrs. Davey, Paxman Colchester, to whom the Committee, taking into consideration the immense extent buildings, and the enormous amount of horse-power required, desire to express their indebtedness. The engines, which are three in number, are of singularly beautiful const and their power is greater than that of any display of electric lighting which has ye place. The principal of these engines is the largest which has yet been applied to poses of electric lighting. It is a high pressure horizontal engine with two cylinders of indicating 350 horse-power, the pressure being 100 pounds steam. It is provid Paxton's Patent Automatic Cut-off Gear worked from the governors, also two fly-wheels in diameter turned in the face, each made to take a 15-inch belt. The boilers for su steam to this engine are of locomotive type and of large size. In addition to this Messrs. Davey Paxman & Co. also supply a Double Cylinder Semi-fixed Engine and capable of indicating 90 horse-power, together with four other engines, one of which compound capable of indicating considerably over 200 horse-power. The vast amount required to supply the boilers, which generate steam for the engines, can best be realis the fact is stated that the Committee have been compelled to lay down a separate 1-i with a service of upwards of 100 pounds per square inch. Thus, altogether about 100 power will be required for lighting the many thousands of electric lamps with which th ings of the Exhibition will be illuminated, and the Committee gladly avail themselve opportunity to express their sense of the good fortune they have experienced in se most interesting exhibit, and also of obtaining, on merely nominal terms, so valuable an an assistance towards the success of the Exhibition.

**DAVIS, JOSEPH, & CO.,** Fitzroy Works, 6 Kennington Park Ro (1) Royal Polytechnic Barometer for use of Executive Committee. (2) Similar Ba for public reference in various parts of the Exhibition Buildings. (3) Thermometer tering and others, for public use in the various Exhibition Buildings.

**DEARDS, W. & S.,** Harlow, Essex. Have glazed, free of cost, wit patent "Victoria Dry Glazing," specially adapted for Fish Markets, the roofs of the the following buildings:—Life-Boat Shed, Machinery in Motion Shed, Russia Spanish Court, Arcade near the Royal Pavilion.

**DEFRIES & SONS,** 147 Houndsditch. Display of Electric Apparatus, ornamental cut-glass Electroliers, in the Entrance Vestibule—many specially prepared for this purpose.

**DICK RADCLYFFE & CO.**—*see* **RADCLYFFE.**

**DOBB, HENRY,** Draper and Outfitter, Westbourne Grove, W. characteristic costumes for the waitresses in the Fish Department.

**DROITWICH SALT COMPANY, Limited,** 8 and 9 Lower T Street, London, E.C. (1) Worcestershire Table Salt. (2) Worcestershire Powdered Sa cooking purposes. This salt is produced from the *oldest* and *purest* natural brine sp the world, and is celebrated for its strength, purity in colour, and excellence of manufa

**ELKINGTON & CO.,** Regent Street, W., and Birmingham. Fi use in the Fish Dining Saloon.

**FROST, EDWIN D.,** Hackbridge, Carshalton, Surrey. A supply o Wandle Trout during the time the Exhibition is open.

**GILES, B., & CO.,** Hot Water and Sanitary Engineers, Blackheath (1) One No. 1 Giles' Patent Gas Cooking Stove, with Oven, 1 Boiler, 1 Steam Kettle Plate, and Hot Closet. The Gas is outside the oven, and will heat oven, boiler, and kettle at a cost of 1*d.* per hour for gas. (2) One No. 2 Gas Cooking Stove, with 1 O Boiler, and Hot Plate with gas outside the oven. (3) Two Pastry Gas Ovens, with ga side the oven. (4) One large Gas Cooking Apparatus, with 2 Ovens, 1 Steam Boiler, Water Tank, 1 Steam Closet and Hot Plate, with gas outside the oven. (5) Six N Training School of Cookery Gas Hot Plates. (6) Six International Gas Fish and Veg *Steamers.* This Steamer will cook a dinner for a large family at a cost of 1*d.* for gas. *Two International* Gas Water Heaters. This Heater will give a continuous supply of water at a cost of 2*d.* per hour for gas.

**W & CO.**, 406 Oxford Street, London. Decoration and Furnishing l Pavilion by Messrs. Gillow & Co. It comprises a large *Entrance Hall*, in the Flemish Renaissance, the walls having panels, Tapestry with subjects of the he Royal Windsor Works, trophies of Arms, Italian Majolica and wrought-iron vith branches for the Electric lights. An opening through Tapestry portières leads fitted in the style of the Italian Certosina. The *Dining Saloon*, of massive walnut, is old Venetian Tapestry, the coffered ceiling in wood having panels of bold orna- and gold, the ceiling of the bay window is decorated with a figure of Venus the sea. The furniture is of carved walnut of the Italian Cinque Cent. period, vered with embossed velvets. The *Boudoir* of H.R.H. the Princess of Wales in the "Adam" style, with pilasters of maize-coloured silk, having enrichments gold. The furniture is of satinwood, with floral decoration Amorini, &c. The with various woods, have panels of cupids after Flaxman, in "bois sur bois" he fernery being on the right, and retiring rooms on the left of this apartment.—Firms who have contributed productions to the Royal Pavilion are: The Royal orks, Windsor—Tapestry; Vincent Robinson & Co., 4 Wigmore Street, W.—Carpets; Stained Glass Works, Old Windsor—Stained Glass; H. B. Daniell & Sons, treet—China and Glass; Elkington & Co., Regent Street—Silver and Bronze Perry, New Bond Street—Electroliers and Branches in Wrought Iron; Dick Holborn—The Fernery, completely fitted with Plants, &c.; Doulton & Co., Lam- tories and Sanitary Fittings; A. & F. Pears—Toilet requisites.

**E, THOMAS, & CO.**, 17, 18 and 19 South Audley Street, London, W. Plates. Ivory colour, mazarine blue aquarium subjects. Fish, reptiles, aquatic Presented for the workmen's and fishermen's dinners.

**YSIDE, ANDREW, & CO., Limited**, Britannia Iron Works, 32 Walbrook, London, One cast-iron Fountain, 12 ft. high, made at the Britannia , Derby, and valued at £140.

**S, Mr., Agent for Fromentin's Patent.** One of his machines rater to Davey Paxman & Co.'s Boilers, indicating about 500 HP.

**, HENRY, & CO.**, 85 Gracechurch Street, London. Shipping he Executive Committee.

**S, HART, & CO.** A patent Progress Fire Resisting Seamless ight Iron Safe, secured by patent Protector Unpickable Locks. Lent for use in fice.

**ICULTURAL COMPANY, THE GENERAL**, 16 Onslow lorists to the Executive Committee.

**LETT, WILLIAM**, High Street, Newmarket, Suffolk. Live of Fish taken from the rivers Lark, Cam, and Ouse, viz.; Burbets or eel pouts; spined loach; common loach; gudgeon; ruff or pope; sticklebacks; millers dd.

**VELL, CLARK & CO.**, Leeds. About fifty pulleys, of all sizes, ssly for the Exhibition on their system of entire wrought-iron construction, so as tness, durability and elasticity for transmission of power, and great facility from being made in halves, and easily adjusted to a running shaft.

**PHREYS, J. CHARLTON**, Galvanized Iron Buildings and Roofing y, Albert Gate, London, S.W. The whole of the Galvanized Corrugated Iron t the Exhibition were erected by J. C. Humphreys. The principal buildings vary the Hall for machinery in motion, 318 ft. × 90 ft., to a mere office, and embrace the pied by Russia and Spain, each 200 ft. × 30 ft., the lifeboat house 300 ft. × 30 ft., of Trade building 218 ft. × 14 ft., Messrs. Bertram and Roberts' Refreshment ft. × 25 ft. and 120 ft. × 22 ft., with kitchens, &c., the Royal Pavilion, the perintendent's Room, the building for the Custom House officers, the Goods shed 0 ft., the Engine House for the Electric Light Machinery, the Fishermen's Home r the Shipwrecked Fishermen and Mariners' Society), the Native Guano Co.'s show rooms, the Manufacturers' and Millowners' Society's building, the Gilding ing Company's Works, the Telephone Company's office, and others. These ave been erected upon Humphrey's Portable Principle, and every Corrugated Iron n the ground is for sale, subject to delivery after the close of the Exhibition. The ll morticed and tenoned (not spiked), so that the buildings can betaken down and peedily and without injury.

**ELLES, W. H., & CO.**, 121 Bunhill Row, London. The entrance xhibition Road. The roof is constructed of Lascelles' patent bent wood curved this process of bending the strength of the wood is retained and houses buil ombine the *advantages of wood* for horticultural purposes with the lightne *iron.*

**LEE, GEORGE HENRY, & CO.**, 22 to 34 Basnett Street, Liverp
The Table Cloths, Napkins, &c., used in the Dining Room.

**LONDON STEREOSCOPIC AND PHOTOGRAPHIC CO.**, T
Sole Photographers to the Exhibition. A similar case to "Henry Head & Co."

**LOVEGROVE, J.**, Slough. Garden Chairs and Seats.

**MAIGNEN, P. A.**, 22 and 23 Great Tower Street, London, E.C. Pur
Aerated water on board ship, or on land, obtained by using Maignen's Patent "Filtre Ra
The special features of this filter, which distinguish it above all others, are :—1.—It can be
entirely to pieces and thoroughly cleansed. 2.—The filtering medium can be thrown away
exhausted, and replaced by fresh in a few minutes, at a very trifling cost. 3.—It
not only organic impurities, but also mineral and gaseous contamination, and softens the

**MERRYWEATHER & SONS**, Greenwich Road, London, S.E., h
very kindly lent the following articles, which have undergone the most arduous servi
the whole of the Sea-water Aquarium supply, 90,000 gallons having been passed th
their steam fire-engine, which has worked without a single stoppage. (1) Two Merry
Steam Fire Engines, Metropolitan Fire Brigade Pattern, with hose and implements, for
Protection. (2) One Merryweather Steam Fire Engine for pumping Salt Water to the
Tanks. (3) One Metropolitan Fire Brigade Manual Fire Engine. (4) One Large Test
Manual Fire Engine. This identical engine gained the First Prize at the Great Exhi
1867. (5) One Dog Cart Fire Engine. (6) One Chemical Fire Engine on Wheels. (7)
Extinctors. (8) Twenty Hand-Pumps and Corridor Fire Engines as used by the Metrop
Board of Works. (9) Several Small Manual Fire Engines, with hose and impl
forming with the Hand-Pumps, Buckets and Hydrants, Standpipes and Hose, equipm
24 Complete Fre Stations. The whole of the above engines and apparatus are placed
disposal of the Executive Committee for the use by the Fire Staff of the Exhibition in
of outbreak.

**METROPOLITAN DRINKING FOUNTAIN AND CATT
TROUGH ASSOCIATION (JOHN LEE, GENERAL MANAGER)**, 111
toria Street, Westminster. Five drinking fountains, with water laid on, and cups fi
use of visitors.

**MOORE, JOHN, & SONS**, 38 Clerkenwell Close, London, E
Clock Makers to H.R.H. The Duke of Edinburgh, The Lords of the Admiralty, the
Department, the India Council, the Colonial Government, the Russian Government, the Q
of Madagascar, &c., have erected (1) in the Grand Entrance a Turret Clock with 3 ft.
dial and a bell of 1½ cwt. This clock is suitable for village church or schools. (2) In
New South Wales division a Turret Clock to strike on a bell of 1 cwt., Graham escapem
zinc and iron compensated pendulum. This clock is suitable for harbour works or
The great clock and chimes of Ballarat made by the firm. (3) In the Greece division a
Turret time-piece. (4) In the chief dining-room a striking clock in walnut case suitable
interior of Town Hall or public building.

**MOORE, JOSIAH, & SONS**, Sekforde Works, St. James's Walk, Clerk
well, E.C. In the windows of Arcade on right hand of Chief Entrance (near Fish Mar
this firm have supplied and fixed some of their Patent Improved Glass Louvre Ventilators
which the admission of air is diffused and is directed upwards, thus causing a continu
circulation of air. They can be regulated at pleasure to any degree by means of a
simple and efficacious arrangement worked by a single cord, and being made chiefly of
no obstruction of light takes place. They can be made to any size, and are suitable
private houses, offices, warehouses, churches, halls, and public buildings generally. In the
window of Arcade on left of Chief Entrance, they have also supplied one of their improved
Circular Glass Ventilators, which are adapted to windows generally.

**MUMFORD, A. G. & CO.**, Colchester. Shafting and Standards for the
Exhibition.

**OLDFIELD & WALTON**, Glasgow. Patent Link Belting for the
whole of the Driving Power in the Electric Light Shed.

**OSLER, F. & C.**, 100 Oxford Street, London, W., and Birmingham.
Have supplied at their own cost the Glass and China for the cheap fish dinner. The
pattern on the China has been specially designed. It is of a piscatorial character, suggestive
the dinner from the fish to the weed, and is singularly appropriate. The initials "I. F. E."
(impossible as a monogram) are dexterously intertwined in the folds of the weed. This firm
also supplies for the Council Chamber a magnificent Electrolier, which is a work of art
glass and metal. They have also decorated the Entrance Hall with a fountain in cut
fish-bowls, &c., together with combined fish and flower-bowls for the entrance
*Aquarium.*

**PARRETT, J. W.**, Forest Hill and Brackley. Has lent for use i
grounds, Summer Houses, Rustic Seats, Vases and other rustic work.

**ATENT VICTORIA STONE COMPANY,** 283A Kingsland Road. s: Stratford, Essex, and Grolly Quarries, Leicester. The Entrance Hall and Fish et are paved with the "Patent Victoria Stone," which has been extensively used as a way-paving material and elsewhere during the last fifteen years. It is composed ne particles of granite, mixed with the best Portland Cement, and afterwards ersed in a solution of Silicate of Soda, specially prepared under the Company's patented ss.

**HILLIPS AND PEARCE,** 155 New Bond Street. 4 Glass Ornaal Fountain Jardinières.

**RIMROSE & CO.,** Church Street, Sheffield. Combined Conservatory Aquarium, so constructed as to be easily removed in sections, glazed on patent Eclipse n with tin lead-bars. Dimensions, 14 ft. by 10 ft., with lantern and iron staging in , with aquarium and fountain.

**ULHAM, JAMES & SON,** Broxbourne, Herts. "Rockifying" all the Tanks in the Aquarium Corridor at less than cost price in the short space of eighteen One of the two Cavernous Recesses free of cost. Decorating the Corridor with a y of Art Flower Boxes, Pots, Baskets, Vases, &c., by loan during the term of Exhibition cost. Also of Vases, Tazze, &c., on various piers about the Exhibition. Manufactured ir Red and Buff Terra Cotta.

**ADCLYFFE, DICK, & CO.,** 128, 129 High Holborn. (1) In Aqua-Section—A Seapool arranged as a grotto, with effects, showing how electric light may be o light up conservatories, &c. (2) In the Royal Pavilion— Conservatory in Early h style, fitted up as a fernery, with roof decorated with creepers growing, and illus- how natural foliage may be utilised in conjunction with the electric light, to illuminate vatories, &c.

**MPLE & CO.,** English Agent, **H. J. ADAMS.** Several of his "Pulley Grippers" to economise transmission of power by straps in the Electric Light nery shed.

**IARP AND MURRAY.** Loan of Nets for drapery to dais on the on of opening the Exhibition, and generally for decorative purposes throughout the time Exhibition.

**IAND & MASON,** 75 Upper Ground Street, Blackfriars Road, have at the disposal of the Executive Committee for use in case of fire a number of their fire-uishing appliances, consisting of:—(1) One Improved Equilibrium Steam Fire Engine, with their Patent Inclined Water Tube. Boiler capable of raising steam very speedily, such y supply to Provincial Towns. (2) An Improved Manual Fire Engine, to be worked by y-two men, of the same pattern as made by them for the Metropolitan, London, and other Brigades. (3) An Improved Curricle Engine, suitable for Villages and Private Estates. No. 3 Metallic Engine, suitable for Farms and Colonial use. (5) Ten Improved Cor- Fire Engines, and Ten London Brigade Portable Fire Pumps, as supplied to Her ty the Queen, His Royal Highness the Prince of Wales, and other members of the Royal ly, &c., &c. (6) Also an assortment of Chemical Fire Engines, Stand Pipes, Hose, Branch , &c., to be used in connection with the above engines, and the hydrants fixed in various of the grounds.

**HIPWRECKED FISHERMEN'S AND MARINERS' SOCIETY.** rmen's Home.

**EBE, GORMAN, & CO.,** 187 Westminster Bridge Road, S.E. Diving Apparatus, Royal Navy pattern. (2) Diver working under water daily, with a one attached to his helmet. (3) Submarine electric light. (4) Large oil painting, the sing of H.M.S. 'Eurydice.'" (5) Large collection of relics from the deep, some of which been collected from the Spanish flagship "Almirante" of the Armada; and the "Mary " lost in the reign of Henry VIII.; relics from the "Royal George;" ancient bronze , with sponge attached to same.

**INCLAIR, JAMES,** 104 Leadenhall Street, London, E.C. (1) Ten No. 5 patent Extincteurs, with three charges of chemicals and leather yokes each. Pedestals anding same. (2) Two new "Express" 20-gallon Extincteurs on wheels, with hose reels large boxes. (3) One "Village" Chemical Fire Engine, with two 20-gallon Extincteurs ted on wheels. Shafts for horse. Two splicing ladders, hose, buckets, lamps, &c. (4) "Victor" Chemical Brigade Fire Engine, one 50-gallon Extincteur, two No. 5 Extincteurs. ted on four wheels, shafts and pole for horses, two splicing ladders, hose reel, charge buckets, hose, lamps, &c., complete. (5) One "Prince of Wales" combined Manual and Chemical Fire-Engine, with four 4½-inch gun-metal pumps in wrought-iron tank, mounted hree-wheels, delivery and suction hose, branch, &c. (6) Six Tyndall's Smoke Filter trators for breathing in dense smoke. These celebrated Chemical Fire Engines have supplied to the Admiralty and various Government offices; they are self-acting and

always ready for action, one gallon of chemicalized water being of greater extinguishin than thirty gallons of ordinary water. The contents are harmless to life, health or pro

**SOLOMON, L. & A.,** 164 to 172 Queen Victoria Street, Londo have supplied desks, washhand stands, looking glasses, &c., for use in the Cheap Fish Department.

**STEVEN, BROTHERS., & CO.,** 35 Upper Thames Street, L (1) Yacht, Boat, Steamer Cabin, Dumpy, and Shop Stoves. (2) Milton Economic Cooking Range. (3) Kitchener, with Steven Bros.' Patent Self-acting Cone Ventilat draws away the objectionable smells from the cooking of fish and vegetables into the thus removing the principal objection to close fire ranges. (4) Deck Pipes. (5 Pumps. (6) Two Hundred Standards.

**STEWARD, J. H.,** 406 Strand, W.C. Thermometers and Barome the Tanks and Aquaria.

**TRELOAR & SONS,** 68, 69 & 70 Ludgate Hill, have given t mats, made of cocoa-nut fibre, as they have done before to similar Exhibitions, a International Exhibitions in London and Paris.

**UNITE, JOHN,** 291 & 293 Edgware Road, London, W. Pr assistance rendered in the supply of awnings, chairs, banners, and other decorati tent, and garden seats with awnings.

**UNITED ASBESTOS COMPANY,** 161 Queen Victoria Stree Supplied about one hundred tons of Asbestos (Indestructible) Paint for the painti exterior and interior of the wooden buildings of the Exhibition.

**UNITED TELEPHONE COMPANY, Limited,** have (by perm of Her Majesty's Postmaster General) arranged with the Committee of the Exhib connect it—without charge—with the Telephone Exchange system by two distinct Call both being fitted up and specially arranged for the purpose, one in the immediate ve the Fish Halls and the other in the centre of the Exhibition.

**UNITED TELEPHONE COMPANY, THE,** 36 Great Coleman S A Central Exchange and fifteen stations for Telephonic communication throug building. The stations are as under:—1. Executive. 2. Parcels office, principal e 3, Dining room (Bertram & Roberts' Office). 4. Machinery for Electric Lighting (Mr. office). 5. Workmen's exit, Queen's Gate. 6. Royal Pavilion. 7. Russia. 8. 9. United States of America. 10. Belgium. 11. Sweden. 12. Spain. 13. India, Cey 14. Press Room. 15. Refreshment Room, North exit, Exhibition Road. 16. Refe Room, North exit, Queen's Gate. 17. Conservatory. 19. Humphrey's Fisherman 21. Call room, fish market. 23. Albert Hall.

**VINCENT ROBINSON AND CO.,** 4 Wigmore Street, W. Carp the Pavilion erected for H.R.H. the President.

**WALSINGHAM, LORD,** Merton Hall, Thetford, has kindly plac undermentioned live fish at the disposal of the Committee, viz.: 1000 golden tench; to 30 pike, of various sizes, say 4 lbs. to 20 lbs.; from 50 to 200 perch from ¼ lb. to 2 lbs 50 to 200 tench (common) from 1 lb. to 5 lbs.; from 50 to 200 Rudd, some up to 2 lbs. and some specimens of carp. The golden tench are bred from the original stock introd Mr. George Duckett Berney, of Morton Hall, Norfolk, in the year 1852.

**WATERLOW & SONS, Limited, (Philip H. Waterlow, Chair** 26 Gt. Winchester Street, London, E.C. The use of offices in the buildings of the Comp a City Office of the Exhibition, and the services of a portion of their staff without any

**WOLFF, M.** Refrigerator for use in cheap Fish Dining Room.

**YOUNG, MAURICE,** Milford Nurseries, Godalming, Surrey. Orna Shrubs and Flowers for H.R.H. the Prince of Wales's Pavilion, and for the L Superintendent's Garden.

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Other Exhibitors of Flowers, whose contributions have done so towards giving colour and beauty to the Gardens of the Exhibition, are

**GENERAL HORTICULTURAL CO., THE** (John W Limited, 54 Regent Street, W. Chief Office: Onslow Crescent, South Kensing

**ALDOUS, J., F.R.H.S.,** 57 Kensington High Street.

**LAW AND SON,** Great Berkhamsted, Herts.

**LEE AND SON, CHAS.,** Royal Vineyard Nurseries, Hammersmi

**WATERER, ANTHONY,** Knap Hill Nursery, Woking.

# ELECTRIC LIGHTING.

ix of Electric Lighting arrangements for the Exhibition, as laid down by different ms and Companies,—each allotment of lighting space to any system being shown on General Plan.

information may be obtained on application to Mr. W. D. Gooch, the Electrical gineer for the Commissioners of the Exhibition, at his Office in the Annexe set apart the Electric Light Machinery.

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**AN UNITED ELECTRIC LIGHT COMPANY,** 9 St. Mildred's 'oultry, E.C. Royal Pavilion. This pavilion is lighted up with about 300 Swan cent lamps, high resistance, arranged in parallel series. The effects of lightning d are various and specially arranged to demonstrate the adaptability of the incan- amp to decorative illumination. The fittings are supplied by Messrs. Perry & Co., of id Street. The effect of lighting by reflected light, the ceiling of the alcove in the oom (Italian) is noticeable. The Conservatory is lit by 60 half-lights, arranged to ars. Dick Radcliffe & Co.'s special class of conservatory fittings, and to give coloured ed light and water effects. The dynamos used to feed the above lamps consist of ng current dynamo with exciter, and a direct current dynamo, both on the Siemens nd placed in the machine shed.

**CHER ELECTRIC LIGHT COMPANY, Limited,** Battersea , S.W. East Gallery (China and Colonies), Machinery in motion and electric y sheds. The Machine Annexe—5 Gülcher direct current low-tension dynamo driving 600 "Crookes" incandescent lights in the China Galley, and 30 arc lamps, her system, in the machinery in motion and electric machinery sheds. The tension urrent throughout does not exceed 70 volts; the lamps are arranged in parallel on numerous circuits running from the machines.

**MENS BROS. & CO., Limited,** 12 Queen Anne's Gate, West- S.W. Conservatory, Main Gallery. In Machine Shed—Two of their large size ng current, WO, dynamo machines, fed by exciters, which give current for 1,200 Swan cent lights, lighting the Main Gallery. One large shunt-wound direct current giving current to feed four large arc lamps in the Conservatory. In Conservatory— 0 cp. arc lamps, Siemens system, for direct currents. These lamps are arranged in rc.—In Main Gallery—1,220 cp. Swan incandescent lamps, ordinary pattern, attached ints of the girders. The illumination in this gallery is to demonstrate the possibility ng large areas by incandescent lighting.

**ER, CHARLES,** Culcheth Hall, Bowden, Cheshire. Dining Rooms, ning Room, Lecture Theatre, Council Room. In Machine Shed—Two Bürgin machines and two Gramme dynamos, direct current machines; each of these feeds lamps, Lever system. Distributed, two in Council Room, two in Lecture Theatre, Kitchens, and twenty-one in Dining Rooms; twenty-eight in all.

**CTRIC LIGHT SUPPLY COMPANY, Limited,** 28 York Street, e Life Boat Shed is lit by this Company with seven arc lamps (Volta) and sixty ent lamps, driven from two Frankland Bürgin dynamos in the Machine Room.

**HINSTONE-VINCENT, MESSRS.,** Entrance Vestibule, Fine lery, &c.—Display 700 incandescent lights (Woodhouse & Rawson's) driven by instone-Vincent dynamo machines in the Machine annexe. The fittings in glass are s. Defries and Sons.

**DHOUSE & RAWSON,** 11 Queen Victoria Street, E.C. Wood- Rawson's Incandescent Lamps in the Vestibule and Fine Arts Gallery.

**UNDS, HENRY,** Victoria Mansions, Victoria Street, S.W. The le Gallery—Illuminated by fifty Hochhausen lamps, worked by two direct current namos in the Machine Room. In the Western Corridor—Five hundred incandescent iven by two H. H. dynamos. On the Upper Terrace a Light Tower, on the same hat in Madison Square, New York; carrying six large lamps of 12,000 cp. each, H. H. dynamo. This tower is designed to light the whole of the Upper Terrace ens.

**GÉRARD ELECTRIC LIGHT & POWER COMPANY, Li** Société Anonyme d'Electricité, Paris. The galleries appropriated to Spain and Russ by twenty-one arc lamps on the Gérard system, actuated by Siemens' alternating dynamo driving ten lamps in Spain and one Gérard alternating current dynamo feed lamps in Russia, both dynamos to be seen in Machine Room.

**FERRANTI, THOMPSON & INCE,** 3 Fenchurch Avenue, E. the Aquarium—One thousand incandescent lamps, Swan type, deriving current machine (Ferranti), and twenty arc lights (Ferranti) of high candle-power (5500), lig Upper Grounds. In the Machine Room—Two Ferranti-Thompson dynamos, ex Siemens' direct current machines, and serving: one, 1000 incandescent lamps, t twenty large arc lights.

**BRITISH ELECTRIC LIGHT COMPANY,** Turk's Head Yard mill St., E.C. The Central Transepts (Norway and Sweden)—Sixteen arc lamps ( driven by Gramme dynamo machines in the Machine Annexe.

**ELECTRICAL POWER AND LIGHT CONTRACT AG** 71 Bishopsgate Street Within, E.C. Fifteen arc lamps (Lea system), lighting Central Transept (Canada and United States); and six Werdermann lamps, lig Board of Trade Shed. Glass Shades for arc lights and Werdermann lights of special and materials by Mr. Pattison, of Pilgrim Road, Upper Kennington Lane. In Mach —Four Gramme dynamos, with two exciters, each exciter actuating two dynamos.

**JABLOCHKOFF ELECTRIC LIGHT & POWER COM LIMITED,** 1 Great Winchester Street Buildings. Main Central Gallery (Net Norway, Sweden, Canada, &c.)—Sixty Jablochoff single-candle lamps, worked Jablochkoff Gramme self-exciting alternating-current dynamos in Machine Shed.

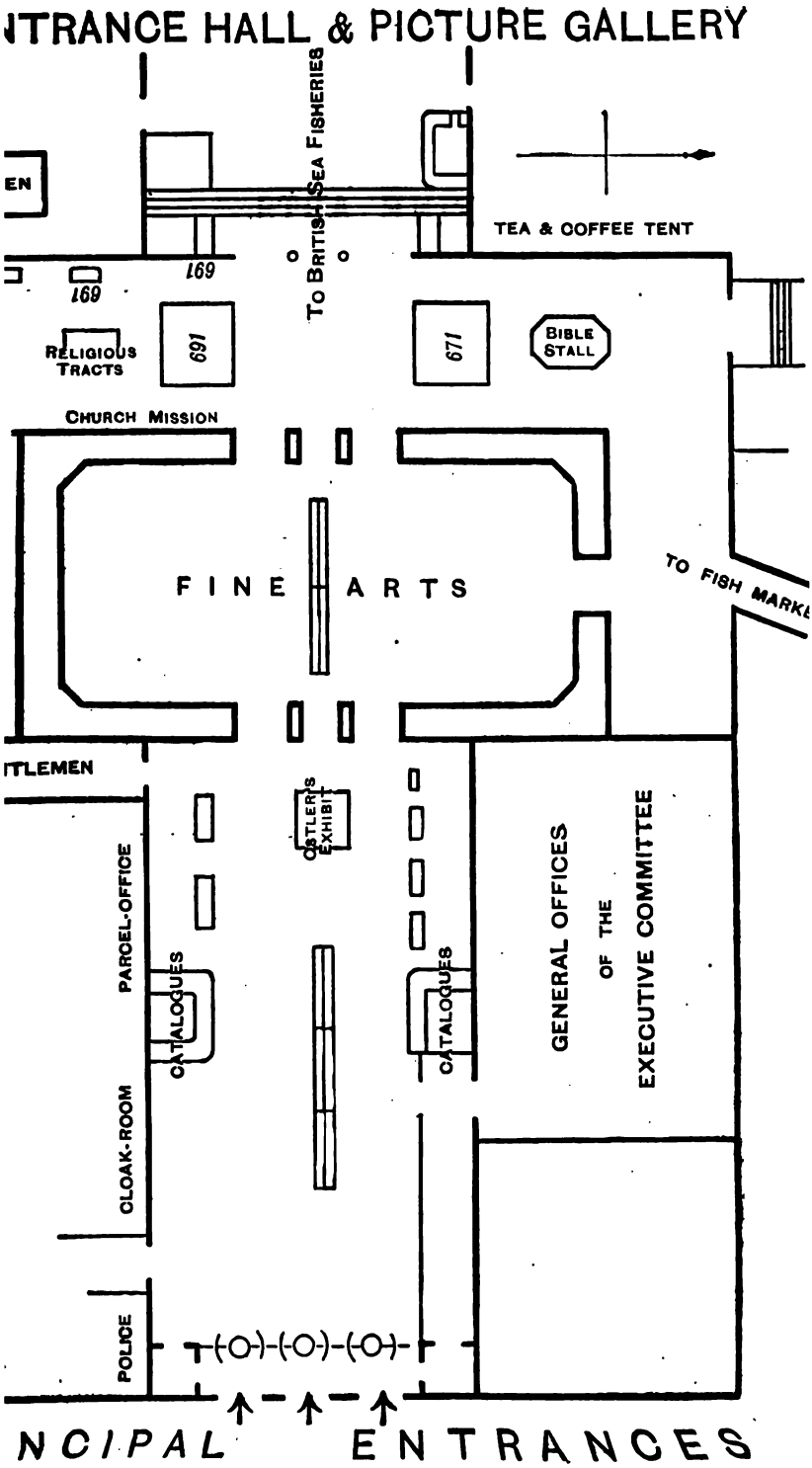
**MATHIESEN, R.**—Pavilion Corridor and Shipwrecked Marine Mathiesen arc lamps, supplied by 3 Mathiesen dynamos.

**GOULARD & GIBBS, MESSRS.** These gentlemen demonstrat system of inductive distribution of electric energy by secondary generators, placed continuous primary circuit in many parts of the building, the generators at the diffe doing work of a totally diverse character, such as arc lighting, incandescent lighting, accumulators, and working motors. Their primary dynamo machines are placed in shed adjoining Machine Room, and are of a compound Gramme type.

**CONSOLIDATED ELECTRIC COMPANY, LIMITED, TH** Cannon Street, E.C. Factory, 67a Cow Cross Street, London, E.C. The B.T.K. Electric Distribution, consisting of Storage Batteries, placed in light iron frames, Master Cell, an automatic contrivance which regulates the quantity of current to the lators, and is also used as a meter for registering the quantity of current supplied. accumulators are durable, light and cheap. This system of Storage is applicable for of Electric Lamp, and for motive power. The Exhibit includes switches, cut-outs, descriptions of Electric Apparatus.

**WILLARD, F. L.,** 85 Hoxton Street, N., Western Quadrant, Six (W arc lamps, driven from one Siemens dynamo in Machine Room.

**NATIONAL ELECTRIC LIGHT COMPANY.** Six Arc Mauw System. One Kennedy Dynamo Machine, lighting the Buffet at West End Sea Fisheries Gallery.


NTRANCE HALL & PICTURE GALLERY
EN
TO BRITISH SEA FISHERIES
TEA & COFFEE TENT
169
169
RELIGIOUS TRACTS
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671
BIBLE STALL
CHURCH MISSION
FINE ARTS
TO FISH MARKE
ITLEMEN
CUTLERY EXHIBIT
PAROEL-OFFICE
CATALOGUES
CATALOGUES
GENERAL OFFICES OF THE EXECUTIVE COMMITTEE
CLOAK-ROOM
POLICE
NCIPAL ENTRANCES

# FINE ARTS.

## OIL PAINTINGS.

[All communications respecting the purchase or sale of pictures shou addressed to Mr. C. W. DESCHAMPS, 1A Old Bond Street, W.]

1–9. **ALFRED, H. J.**, 20 Moorgate Street, E.C. (1) Not Caught Price £4 4s. (2) Anxious Enquiries. Price £4 4s. (3) Won by a Head. Pri (4) Life's Sunset. Price £4 4s. (5) "Foul." Price £4 4s. (6) The Rise. Pri (7) Set of Minatures; episodes of salmon fishing. Price £26 5s. (8) Set of Mina Fish. Price £26 5s. (9) Thames Trout; in season and out of season. Price £30.

9*a*. **ADAMS, G. G.**, 126 Sloane Street. Fish Painting, by J. Fyt.

10. **ANSDELL, RICHARD, R.A.**, Lytham House, Kensington. years ago; before the Salmon Act.

11–15. **ARNOLD, HARRY**, 162 Conningham Road, W. (11) The jack seizing roach. Price £25. (12) The Biter Bit; jack caught by spinning lan £25. (13) Perch. Price £7 7s. (14) Shad. Price £3 3s. (15) Chub. Pri

16, 17. **ARTZ, D. A. C.** (16) "A Dutch Fisherman at Home." Pri (17) A Fisherman's Wife (Holland). Price £63.

18, 19. **ASHE, J. W. L.**, Heathside, Bexley Heath. (18) A Rough on the Cornish Coast. Price £52 10s. (19) A Nook on the Cornish Coast. Price £

20. **BAKER, F. W.**, 115 Belsize Road, Abbey Road, N.W. "A C Fisherman's Home. Price £7 7s.

21. **BANNATYNE, J. J.**, 5 Albert Street, Regent's Park. "A Hig Salmon River. Price £35. (*See Water Colours*).

22. **BELSHAW, FRANK**, 13 Sherwin Street, Nottingham. " Caught." Price £16 16s.

23. **BIRD, C.**, 106 High Street, Lowestoft. Fishing Boats Lowestoft Harbour. Price £42.

24, 25. **BISHOP, W. R.**, 5 Union Square, Islington, N. (24) Sal Trout, Perch, Chubb, and Dace. (25) Jack, Dace, and Roach. Price £27 10s. the pai

26. **BLOGG, MRS., NELLIE**, 5 Mount View Villas, Crouch Hornsey. "Soldier and Sailor." Price £4 4s.

27–29. **BLOOMER, H. R.**, Cookham, Dean, Berks. (27) A Devon Fisherman; study from nature. (28) A Sketch of the Sea. (29) Tynemouth Harbour.

30. **BRÉANSKI, GUSTAVE DE**, Cookham, Berks. "Fishing making for Whitby Harbour. Price £55.

31–34. **BRACKETT, W.** (the late), of Boston, U.S.A. (31) The (32) The Leap. (33) The Struggle. (34) Landed. All lent by R. Potter, Esq.

34*a*. **BRISCOE, W. W.**, 2 Walters Road, South Norwood. Club.

35, 36. **BROOKS, THOMAS**, 3 St. Helen's Terrace, Alexandra Hastings. (35) "Fishing Cobles running for shelter, Runswick, Yorkshire." Price £ (36) "Lynmouth, North Devon, Life-boat going to the rescue." Price £157 10s.

37, 38. **BROOME.** (37) Ramsgate Life-boat, "The Bradford," proceed to the rescue of the crew of the "Indian Chief," on January 5th, 1881. (38) "Return Lifeboat." Both lent by W. H. Bacon, Esq.

39. **BROWNING, ROBERT BARRETT**, 19 Warwick Crescent, W. Stall in the fish market at Antwerp.

39*a*. **BURGH, H. V. D.** Dutch fisherman. Price £85. Lent by D W West, Esq.

40, 41. **CAFFIN, W. W.** (40) Eel Bucks on the river Kennet. Pri (41) The Angling Friends. Price £20. Both lent by Alfred G. Jardine, Esq.

42. **CALLCOTT, W. I.**, 48 Flanders Road, Bedford Park, Chiswick, "Herring Smacks Arriving;" Gorlestone, Great Yarmouth. Price £238.

**CAMERON, HUGH, R.S.A.,** 22 West Cromwell Road, S.W. usly Waiting." Price £200. Lent by Adam L. Cochrane, Esq.

**CLARK, JOSEPH,** 396 Camden Road, N.W. "The Fisherman's " Price £63.

**CLAXTON, MARSHALL.** Isaac Walton. Lent by the Piscatorial

47. **CLAY, SIR ARTHUR, BART.,** Burrows Lea, Gomshall, Surrey. Mending Nets." Price £31 10s. (47) "The Fisherman's Boy." Price £63.

**COX, FRANK E.,** 5 John Street, Bedford Row, W.C. "Baiting the Pots." Price £42.

50. **COOPER, DAVIS,** 103 Gower Street, W.C. (49) Sea Trout . Price £21. (50) Loch Fishing. Price £21.

**COOPER, A. W.,** 7 Manor Road, Twickenham. Hampshire Trout. 30. (*See Water Colours.*)

**COLLINSON, R.,** 20 Hereford Square, South Kensington. Crab le of Wight. Price £100.

**COLLINSON, H. L.,** 20 Hereford Square, South Kensington. Fresh Fish.

60. **CRAFT, PERCY R.,** Stanmore Lodge, Penge Lane, Sydenham, S.E. Last of the Oyster Boats, Port Enyon, South Wales." Price £12 12s. (55) "The Yard in Chancery, Shoreham." Price £12 12s. (56) "A Cornish Fishing-Village." 21. (57) "An Afternoon on the Beach." Price £12 12s. (58) "Watching the Fleet." Price £21. (59) Making Crab Pots, Cornwall. Price £10. (60) A 's Haven, Cornwall. Price £25.

62. **CULLIN, J. R.,** 18 Warwick Gardens, Kensington, W. (61) and Trout. Price £30. (62) Perch, &c. Price £40.

**DUYNEN, VAN ISAAC.** Sea Fish. Price £350. Lent by ardine, Esq.

65. **EDWARDS, EDWIN** (the late), care of Mrs. Edwards, 26 Golden (64) By the Salmon breeding boxes, Sunbury-on-Thames. Price £35. (65) Fishing, Mullion Cove. Price £35.

68. **ERSKINE, NICOL, A.R.A.,** 24 Dawson Place, W. (66) Storm Lent by E. Priestman, Esq. (67) "Steady, Johnnie!" Lent by David P. McEuan, (68) "Il Piscatore." Lent by Mr. L. H. Lefevre.

70. **FARREN, R. T.,** Cambridge. (69) "Chub from the Ouse, Cam- Lent by W. Farren, Esq. (70) Perch and Bream from the Ouse. Lent by W. Esq.

**FENNELL, GREVILLE.** Glen Sannox, Isle of Arran. Lent by achs, Esq.

74. **FISHER, A. E.,** care of Mr. Hensman, 33 Harley Street, W. (72) aken in Herts. Price £10 10s. (73) Chub from the New. Price £10 10s. ike from the Daventry. Price £10 10s.

**FISHER, DAN.,** Wheeler Street, Witley, Surrey. "Landing at Whitby." Price £68 5s.

**FORBES, ANNIE A.,** 10 Coburg Place, Bayswater Road, W. nd at Last." Price £20.

80. **FORSTER, C.** (77) Salmon, Perch, and Roach. Price £12 12s. ack, Chub, and Roach. Price £12 12s. (79) A Catastrophe (after Bateman). Lent Sachs, Esq. (80) A Brace of Trout (after Rolfe). Lent by T. R. Sachs, Esq.

82. **FORSTER, J.** (81) Galway Fish Girl. Lent by Alfred G. Esq. Price £20. (82) Slapton Ley Fishery. Lent by Alfred G. Jardine, Esq. ne.

84. **GARLAND, H.,** 3 Woodfield Terrace, Harrow Road. (83) "A man's Yarn." Price £150. (84) "What Luck, Jack?" Price £75.

86. **GEDDES, WM.,** Gowanbrae Cottage, Blair Gowrie. (85) "Nothing March Brown." Price £21. (86) "Old Isaac's Favourite." Lent by D. Scott, Esq.

**GILLIG, F.,** (1680). Lent by Joseph Grego, Esq. (87) Group . Price £40. (88) Group of Freshwater Fish. Price £20. (89) Freshwater Jets. Price £30.

**GRAHAM, T.,** Stanhope Yard, Delancey Street, N.W. "Oh, the of the *Wooden Shoon.*" *Lent by Mrs. Stewart.*

**91. GRIFFITHS, TOM,** 31 Rochester Road, N. Oyster Beds, Mumb Swansea; Early Morning. Price £60.

**92, 93. HAWKSLEY, ARTHUR,** 2 Queen's Road Studio, St. Joh Wood. (92) Departure of Leigh Shrimping Boats. Price £40. (93) A Ga Patience. Price £18.

**94–96. HAYES, EDWIN, R.H.A.,** Briscoe House, Steele's Road, N (94) Dutch Fishing Pinks returning from Sea. Katwyke Beach, Holland. Pri (95) "Life-boat." Lent by Sir Matthew White Ridley, Bart, M.P. (96) S Price £22.

**97, 98. HAYLLAR, J.,** Castle Priory, Wallingford. (97) "A Bo Fish Wife." Price £7 7s. (98) "A Trout Stream." Price £5 5s.

**99–100*a*. HEMY, C. NAPIER,** 1 Park Terrace, Falmouth. "Saved." by Major A. G. Sandeman. (100) The Morning Catch. Lent by W. B. Waterlow (100*a*) Clearing the Nets. Lent by Lieut.-Col, Sandeman.

**101. HEMY, T. M.,** 6 Alma Square, Abbey Road, N.W. "Through Sparkling Waves." (*See Water Colours.*) Price £50.

**102. HENDERSON, J.,** 227 Hope Street, Glasgow. "Fishing-Boat Anchor, Sound of Kilbramen." Price £126.

**103. HENSON, EDWARD.** Portrait of F. G. Pearce, Esq. Lent The Piscatorial Society.

**104. HODGSON, J. E., R.A.,** 10 Hill Road, Abbey Road, N. W. "S Water Fisherman."

**105. HOLLOWAY, C. E.,** 36 Gloster Road, Regent's Park. "A Y mouth Shrimper." Lent by W. E. Haycock, Esq. Price £125.

**106–113. HOLROYD, E. A.,** 2 Cricklewood Lane, N.W. (106) Gra Price £7 7s. (107) Caught. Price £21. (108) Wandle Trout. Price £ (109) Perch. Price £7 7s. (110) Frozen Out. Price £10 10s. (111) W Price £15 15s. (112) Landed. Price £15 15s. (113) Portrait of Isaac Walton. by the Gresham Angling Society.

**114. HOWARD, G. W.,** 85 High Street, Battersea. Fish. Price £25

**115–117. HUME, E.,** South Harting, Petersfield. (115) "A Corn Fishing Village." Price £52 10s. (116) "Corking the Net. St. Ives." Price £ (117) "Waiting. Berck-sur-Mer." Price £52 10s. (*See Water Colours*).

**118. HUNTER, G. SHERWOOD,** 209 King Street, Aberdeen. "Sal Fishermen Emptying a Fly-Net, Aberdeen Beach."

**119. HOGARTH, W.** Billingsgate 1754. Lent by Miss Wright, Sutherland Gardens.

**120. HUNTER, COLIN,** 14 Melbury Road, Kensington. "The Sil of the Sea." Lent by Sir Donald Currie, K.C.M.G., M.P.

**121–124. ISRAELS, JOSEPH,** The Hague, Holland. (121) "The T of the Village." Lent by G. Webster, Esq. (122) Old and Worn Out. (123) Yachting Party. (124) "For these and all your mercies." 122–124 lent by Forbes, Esq.

**124*a*. JONES, C. M.,** 145 Chesterton Road, W. "After a hurricane the Gulf of Florida." Price £4.

**125, 126. JOPLING, MRS. LOUISE,** 28 Beaufort Street, Chelsea. (125 A Bordighera Fisherman. Price £5 5s. (126) On the Riviera. Price £3 5s.

**127. KENNEDY, C. N.,** 192 Alexandra Road, N.W. Whitby. Price £42

**128. KING, HAYNES,** Camden Studios, Camden Street, N.W. " Mussel Gatherer." Price £27 10s.

**129–131. KNELL, A.,** 15 The Grotto, Cliftonville, Margate. (129) " Derelict on the Goodwins—the Fisherman's Prize." Price £42. (130) "Evening on Thames." (131) "A Tranquil Night at Sea." Price £6 6s.

**132, 133. KNELL, W. C.** (132) Fishing boats in a breeze off Sheerness (133) Fishing boats making ready for Sea.

**134, 135. KNIGHT, A. R.,** Summerwell Place, West Green, Tottenham (134) "Not Caught Yet." Price £12 12s. (135) "Just Caught." Price £12 12s.

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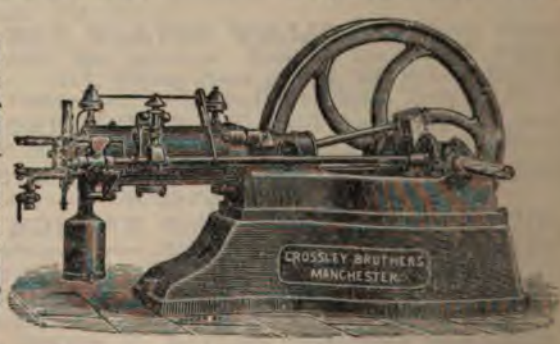


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## Sea Fishing.

head is included everything immediately relating to and connected with the actual all kinds of fishing. The class has been naturally and conveniently divided into s—sea fishing and freshwater fishing; and it is to the more important section of that attention will first be directed.

e importance of the sea fisheries will be perhaps better understood when the objects now brought together before the public have been examined, and it is ow many trades must be kept at work, and how much knowledge in various forms to provide the fisherman with the apparently simple means of carrying on his ation of catching fish. The demand for sea fish is constantly increasing. This eads to greater enterprise among the fishermen; and capital, in the majority of cumulated savings from years of hard work at the fisheries, is invested in additional ear for the further development of an industry which, laborious as it is, yet rarely ing a more or less profitable return to all who are concerned in it. The special fishing during recent years has been, however, in the deep sea, and nothing has remarkable in this respect than the rapid growth of beam-trawling, especially in Sea, where a great extent of suitable ground is always available. It is from this nd by the method of fishing known as "beam-trawling" that the London and rkets are mainly supplied with turbot, brill, and soles among "prime" fish, and of tons of plaice, haddock, and other common fish are obtained and distributed es among the poorer classes throughout the country. The peculiar construction of rawl will well repay examination, and some idea will be obtained of the manner in large numbers of fish are taken whilst the net is being silently towed over the irely out of sight of the fishermen.

nly in importance to the trawl is the drift-net, the method by which mackerel, d pilchards are principally captured. In this case we have nets which are in general nd our coasts, and employed at long as well as at moderate distances from the their name implies, "drift-nets" require plenty of room, for they are carried he tide may drift them during the few hours they are left in the water; and their acter will be readily understood from the numerous specimens exhibited, differing general appearance except in the size of the mesh, which is adapted to the kind nded to be taken. Few people who are not fishermen have any idea of the hundreds usands of miles of net which almost nightly in the regular fishing seasons float like or barriers in the sea to intercept and mesh the shoals of fish as they gradually vards the coast. The drift fisheries are altogether a very important industry, both s and those countries bordering on the North Sea and the Channel, and in he drift herring fishery is looked forward to as the most valuable harvest nets already mentioned, many other varieties will be found abundantly represen- g them the gigantic funnel-shaped stow-net, by which thousands of tons of sprats every winter at the mouth of the Thames and other places on the south coast of d the sean, seine, *or sweep-net (the* ancient *Sagena*) the oldest form of net of which

we have any distinct record. More universal in its use than nets, and of particula for the capture of certain kinds of fish, line fishing must always possess a great de It represents probably the earliest method of fishing, and fish hooks of some and often of the roughest kind, have been found in use among the most unciv met with by early navigators. Line fishing in this country is extensively carri capture especially of cod, ling, haddock and whiting, and hooked fish of these l command a higher price than those caught in the trawl as their delicacy is no the knocking about to which they are subjected when massed together among t often crowded contents of the beam-trawl. The various plans adopted in differ for fitting out the special gear for the capture of particular kinds of fish both and long line are well represented, and no doubt may be studied with advantage.

Objects of special interest will be found in the numerous models of, and the boats and vessels in which the fisheries are carried on. The increasing recent times to fish at long distances from the land and to remain at sea for even at a time, has led to a marked change in the character of the fishing vessels a has induced builders to study the advantages of greater size and improved de construction of vessels capable of facing the bad weather to which they are s later to be exposed. Even in the smaller boats more commonly employed in the advantage of their being decked is daily becoming more evident, for they ca weather and therefore can risk going farther to sea, and seeking the shoals o formerly they dared not venture. The most important improvement, however, l with fishing craft is the employment of steam power; and it is applied in v although the additional expense incurred interfered for some time with even its p adoption. Its advantage, however, is very great, enabling the fishing boats t return quickly from their fishing grounds, saving both time and labour in h nets, and especially in the case of deep-sea trawling, where fast steam "carriers fish from a fleet of trawlers, and make the best of their way with it to the nea so that whether used as a partial substitute for sails, for economising labour o or securing a quick delivery of the fish at the market, the application of stea vessels must be regarded as one of the most important steps yet taken in the de the deep-sea fisheries. The sea-going character of so many of our fishing ve them also to be fitted out with more elaborate appliances than were ever thoug simple-minded fishermen of little more than a generation back. They have now everything on a larger scale, and they find the benefit of numerous inventiona improvements in capstans, compasses, lights, barometers, &c., helping them to d more easily, and to take better precautions against the many dangers to which they in the stormy weather they have so frequently to contend with.

The dangers to which fishermen are so often subjected when at sea are, how only ones they have to deal with, and on many exposed parts of the coast their great frequently meets them on their return home, when they have perhaps to run bef for the narrow entrance of the little fishing harbour which is the only protection t their boats. Sad tales of distress might be told of boats being dashed to pieces piers in attempting to enter some of the little harbours on the Scotch coast, or, l properly make the entrance, are helplessly driven on the neighbouring rocks within sight of their homes. Models of suitable artificial harbours for fishing-b deserve the best attention, and in connection with this subject some proposed breaking the force of the sea at the entrance to harbours may be examined with in

Life-boats and life-saving apparatus will probably appear to many people to ha to do with sea-fishing; but unfortunately such is not the case. The large sca the deep-sea fisheries are now carried on, and the boat work necessary for conveyi from the trawlers to the carriers in all kinds of weather, open a wide field for life-belts, and the adaptation of some of the principles on which life-boats are co the small boats belonging to the fishing vessel. Fishermen are, however, very cardi and, like sailors in general, are disposed to regard simple precautions for safety as l doubt of their courage and hardihood. The winter storms however rarely pass w the fishermen finding the advantage of the life-boat system which has been a

ised around our coasts. The splendid display of life-boats and life-saving apparatus bear g testimony to the wide interest now felt at home and abroad in this important subject. ly, some attention is being given to the means of communicating from the shore to lights or possibly to stations for fishing vessels by submarine cables or methods of signalling; slight consideration of the variety of objects now brought under notice will show many interests are concerned in the practical working of the sea fisheries, and in ing the large supply of wholesome food which is daily brought in from them to the

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*Choicest Specimens of Artificial Bait, Lines, Nets, etc.*

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(WHOLESALE AND RETAIL.)

## SPLIT CANE RODS.

First Quality, wonderfully Powerful, beautifully Light. No Angler can appreciate their worth till he has used one. *No other* Rods compare. All Lengths in Stock.

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| 18 ft. Salmon Rods | .. .. .. .. | £15 15 0 |
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*Second Quality, similar Rods, at Lower Rates.*

Salmon, Trout, and Pike Rods of warranted excellence, from £1 1s.

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## THE IMPERIAL TROUT ROD. *Price £1 1s.*

Designed and made specially for this Exhibition, and Samples on view at our Stand. Should be seen by every Angler. For prettiness of pattern, quality of workmanship, utility of design, and lowness of price—it is unique.

*Sole Agents in Great Britain for the celebrated Fluted Spoon and other Baits made by* SKINNER *of New York.*

The Largest and Finest Collection of Fishing Tackle in London.

**Complete Outfits for any kind of Fishing, in any part of the World, can be selected from our very extensive Stock.**

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# W. WATSON & SONS,

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(ESTABLISHED 1837.)

# CATALOGUE.

## SEA FISHING.

DIVISION I.—[*Deep Sea Fisheries Gallery.*] *See Plan, p.* 8.

**of every description and of all nations used in trawl, herring .e, hand line, and every other mode or system of fishing, ıg all nets, lines, hooks, harpoons, tackle, &c., employed in ıe.**

*tion numbers commence on the left hand at the main entrance to the British Deep ies Gallery.*

**AVIS, FREDERICK,** 5 Wentworth Terrace, Forest Road, Not- Platted Herring Fishing Net made by machinery.

**NOWLES & KNOWLES,** Zebu Works, Southcoates, Hull. (1) Trawl Net, for beam 50 ft. long. (2) Collection of Trawl Nets. (3) Collection of 'ish Drying, Bark and Tan, &c. (4) Show Cases of Netting, Twines and Sundries. ıg Net Lines, Lead and Long Lines, and Sundries. (6) Trawl Net and Gear com- North Sea Trawler, Beam, and Iron Heads. (7) Collection of Coal and Ice Bags and ıg, &c. (8) Portable Boat.

**E CAUX, JOHN WILLIAM,** Great Yarmouth. (1) Patent Apparatus for Smacks and Yachts, Trawl-wheels, Funnel-nets to prevent the escape fishes, Roller Ground-ropes, and Cod-ends, with the meshes kept widely open to allow fishes and refuse to escape therefrom. Also the apparatus by which, at pleasure, the disconnected from the trawl-beam at the bottom of the sea, and shut up and brought ace separately from the trawl-beam. (2) Patent Crab and Lobster Trap, to permit only of small crustaceans which it is illegal to catch. This trap can be opened and thout trouble or danger.

**OLKESTONE, MAYOR OF.** Folkestone Collection of Fishing Lines, Trawl Net and Gear, Mackerel, Sprat, and Prawn Nets, Lobster Pots.

**WILLESDEN" WATERPROOF PAPER AND CANVAS** Limited, Willesden Works, Willesden Junction, London, N.W. Samples of "Wil- Rot-Proof Nets, Canvas, Ropes, Netting, Salmon Nets, Landing Nets, Canvas Bags, Apparel, &c., &c., treated by the "Willesden" Waterproofing Process.

**IORRIS, C. W.,** Harbour View, Lowestoft. (1) Trawl Net, as used ore fishing. (2) Trawl Net, with improved cod end to allow immature fish to escape. ımmer Herring Net, for longshore fishing. (4) Autumn Herring Net, for longshore (5) Sprat Net, for longshore fishing. (6) Fleet of Cod Lines, for longshore fishing, s ready for Baiting, with Dans, Dantows, and Anchors complete. (7) Draw Net, as ıe East Coast of England. (8) Simple Machine, for making Norsels or Snoods of any (9) Model of Set Sprat Net for longshore fishing. (10) Model of a Boat, used as a ıd Stow Boat, with permanent ballast, as used where there is a harbour, with two awls, and small bow net in centre, which is continually hauled so as to ascertain here are shrimps on the ground being passed over; in the event of the ground being ırimps the larger nets are hauled and the ground retraced. Scale 1 in. to the foot. el of Shrimp Boat, as used where there is no harbour, and have to be worked from the last dischargeable when coming ashore. Scale 1 in. to the foot. (12) Dinghy, full l with Morris's Patent Revolving Rowlocks and Sliding Tholes, for life-saving and urposes. These when once fastened to the boat cannot be lost or removed, and are

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**China Dinner, Dessert, Tea & Breakfast Services.**
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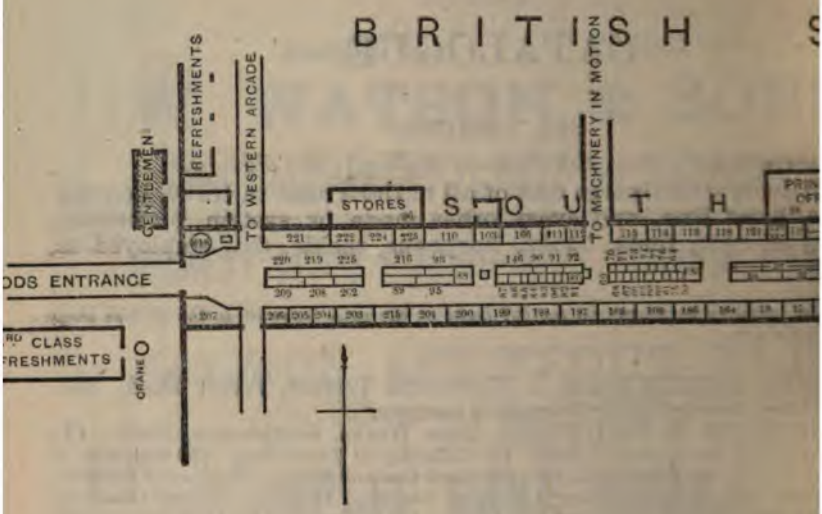



easily shipped and unshipped night or day, being therefore invaluable in cases collisions. (13) Trunk Net (a hand-net used for catching crabs and lobsters), for use, used in a fleet of about one to two score by longshore fishermen. (14) St (15) Improved Roller Bow Shrimp Net. (16) Bow Shrimp Net (present style Pot, for use in salt water.

7. **DYNE & EVENS,** York Road, Limehouse, London, E. (1 of Blocks for Rope Strop: Internal Iron Stropped: External Iron Stropped: Wh Rope Stropped. (2) Samples of Patent and other Sheaves and Bushes: Iron Bindings: Steering Wheels: Signal-Gun Carriages: Capstan Bars, Handspike Mast Hoops: Bulls' Eyes, Dead Eyes: Mallets, Pump-boxes, Trucks: Brewers' F culean" Blocks and "Iris" Sheaves: Shackles, Hooks, Thimbles and General Ship

8. **BERNEY, GEORGE DUCKETT,** Morton Hall, Norwich. and original Harpoon Gun used for Whales. Invented and used by Capt. Manb Thomas Trench Berney's Spring for Punt Guns applicable also to Harpoon Guns. Hand Harpoon. (4) Ditto, with handle and line.

9. **HENRY, ALEXANDER,** Gun and Rifle Manufacturer, Saint Andrew Street, Edinburgh, and 118 Pall Mall, London. (1) Patent H Harpoon Gun. (2) Harpoon, with jointed flukes. (3) Muzzle-loading Harpo Harpoon, with fixed flukes. (5) Patent Breech-loading Bomb Lance Gun. (6) (empty). (7) Two Patent B. L. Sealing Rifles. (8) One ditto, highly finish ditto, with self-cocking action. (10) Two Double-barreled Henry B. L. Expre in case). (11) Two Double C. F. Guns (one in case).

10. **FOWLER, WILLIAM,** Whale Fishing Implement M Street, Peterhead. (1) Harpoon Gun. (2) Three Harpoons, different styles. Whale Line. (4) Gun Lance.

11. **MATHESON, MURDO,** Scornie, N.B. (1) Long Line. (2) Lobster and Crab Pot.

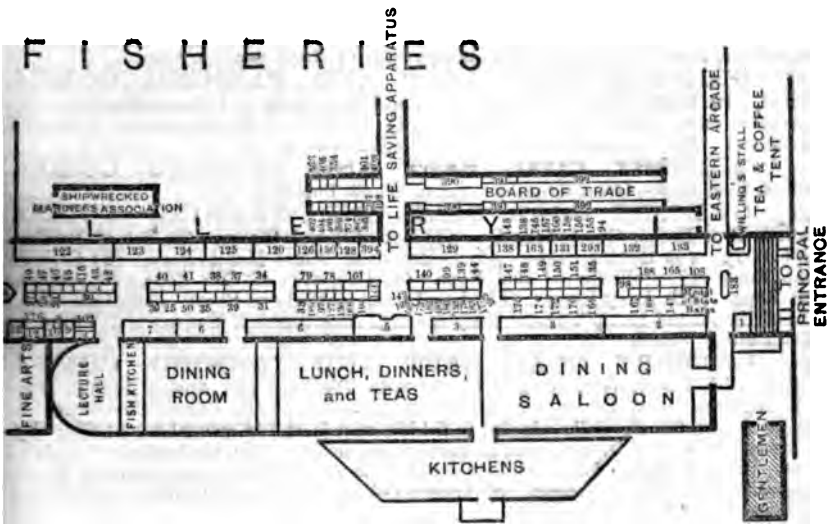
**"WILLESDEN PAPER**

**Waterproof — Rot-proof — Weatherproof.**

NOTE.—The Roofs and Buildings, FISHERIES EXHIBITION, made of "WILLESDEN" PA were fitted up by order of the Council in the beginning of the year, and have consequently *exposed to all the wet and severe weather of the early Spring.*—**Also Decorated Lin Grand Entrance Hall.**

"Willesden" Canvas, Scrym, Fishing Nets and Cordage. Rot-proof and Water-repellent

See Catalogue Entries :—




WILSON BENNISON. SURVEYOR TO EXECUTIVE COMMITTEE.

**OSBORNE, CHARLES & CO.,** 12 & 13 Whittall Street, Birmingham and 3 Broad Street Buildings, Liverpool Street, London. Harpoon Gun and Harpoon Line.

**ALEXANDER & CO.,** 190 Westminster Bridge Road, London, S.E. "Bezer Thomas" Patent Self-Acting Releasing Hook for discharging cargo, and hoisting goods generally. The "Bezer Thomas" Patent Slip-Hook for Towing purposes, Boat Towing, &c. The "Bezer Thomas" Patent Slip-Link for the harness of fish carts and vans. The Patent Slip-Hooks are designed as a substitute for the ordinary tackle hook, and possess advantages that they form an automatically "Moused" hook when in use, which can be used under strain without danger or difficulty.

**GRIMSBY, COMMITTEE FOR.** Nets, showing process of manufacture.

**MCINTOSH, HAROLD BLYTH,** 98 Kent Street, Great Grimsby. Patent Main Sheet Chock, with Rubber Springs and Photograph of same.

**PALMER, ENOCH,** Cleethorpes Road, Grimsby. Medicine Chest, used for Fishing Smacks.

**DUKE, JAMES,** Bethlehem Street, Grimsby. (1) Two Plans of Fishing, Trawling, and Carrying Vessels. (2) Two Improved Smacks' Cooking Stoves, Utensils for ditto for Cooking, in tinned and patent enamelled ware. (3) Two Anglo-Main Stoves, specially adapted for cooking fish. (4) Two Cabin Heating Stoves for cod vessels. (5) Six Fish and Ice Weighing Machines. (6) Three Patent Folding Seats, for smacks and yachts where space is limited. (7) One Improved Continuous Blast Horn. (8) Six Aquariums, suitable for fresh and salt water fish. (9) One Show Case, complete sets of Lamps. (10) One Show Case, with brass fittings, for smacks, engines, general purposes. (11) One electric Call and Signal Bell, adapted for smacks, lighthouses,

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FISHING & YACHTING BOOTS FOR LADIES,

*AS MADE EXPRESSLY FOR HER MAJESTY THE QUEEN.*

ANDERSON, ABBOTT, & ANDERSON, 37, Queen Victoria Street, E.C.

&c. (12) Three Rapid Water Filters. (13) One Refrigerating Apparatus for fishing (14) Ditto for general purposes.

14*d*. **BYGRAVE, JOHN,** Fish Dock Road, Great Grimsby. Co of Sea Boots, Dock Boots and Shoes as largely used by North Sea fishermen.

14*e*. **GRIMSBY COAL SALT AND TANNING COM** Limited, Fish Docks, Great Grimsby. (1) Trawl Net, Beam and Heads complete. Lines of all descriptions. (3) Hand Lines. (4) All kinds of Hooks employed in the Cod Fishery. (5) Hooks and Snoods. (6) All Kinds of Snoods.

14*f*. **GRIMSBY COAL SALT AND TANNING COM** Limited, Fish Docks, Great Grimsby. Set of Whelk Pots with Gear.

14*g*. **GRIMSBY COAL SALT AND TANNING COM** Limited, Fish Docks, Great Grimsby. (1) Set of Trawl Warps. (2) Set of Bri Small Warp. (4) Hauling Line. (5) Collection of White Manila Rope. (6) Coll Hemp Rope. (7) Collection of Bolt Rope. (8) Collection of Coir Rope. (9) Coll Wire Rope. (10) Buoy Lines. (11) Log Lines. (12) Lead Lines. (13) Collect kinds of Manila and Hemp Twine. (14) A Large Assortment of Canvas and Twin by the Fishing Vessels.

14*h*. **GRIMSBY COAL SALT AND TANNING COM** Limited, Fish Docks, Great Grimsby. (1) Side, Masthead and Anchor Lights, Deck Lanterns, Cabin Lamps, Vanes, &c. (2) Compasses, Logs, Clocks, Binoculars, Cooking Apparatus, specially adapted to fishing vessels and in general use at Grim All kinds of Cooking Utensils used in the Grimsby fishery. (5) Mechanical and H Horns. (6) All kinds of Knives used by fishermen. (7) The more approved A Compositions for Fishing Vessels. (8) Various Colours of Paint and Varnish, specially for the use of fishing crafts, Oils, &c.

14*i*. **GRIMSBY COAL SALT AND TANNING COM** Limited, Fish Docks, Great Grimsby. (1) Nets in various Stages of Manufacture. purpose we shall have several of our factory hands employed in the Exhibition (2) Snood Making. We shall also have one of our boys employed in this business.

14*k*. **ALWARD, GEO. L., & ESKRIETT, J. & C.,** Fish Docks, G Complete Model of Sailing Trawler and Gear, best adapted for North Sea fishing, with improvements and appliances, including steam and hand capstan, ice machine, oscillating mainsheet buffer, built 1 inch to foot, and complete in every detail.

15. **HEARDER & SON,** 195 Union Street, Plymouth. (1) C Artificial Spinners, Sand Eels, Soleskin Baits, and samples of Artificial Flies, Gi Traces and Lines, used in Sea Fishing. Invented and manufactured by Exhibit Mounted Lines for Whiting, Cod, Conger, Hake, and all bottom fish. (3) Mounted L Pollock, Mackerel, Bass, Lythe, Billet, and all surface fish. (4) Long Line with fl latest Improved Revolving Head Link and Detachable Snoods. (5) Floating Tr Spillers. (6) Hearder's Patent Otter Trawl (Model). (7) Hearder's Gunwale W winding in deep-sea lines. (8) Net, collapsing, Crab, Lobster, Conger, Eel, and Pra ditto in wicker and wire. (9) Oyster Dredges, and Naturalist's, ditto, Sieves and (10) Mounted Nets for Pool Prawns, Strand Shrimp Nets, Dip Nets, Baited Pa Whitebait Nets, Landing ditto. (11) Prawn Dredge for shallow water. (12) Vari trivances for sea fishing, invented by Exhibitors.

16. **EDINBURGH ROPERIE AND SAILCLOTH CO.,** blished 1750, Bath Street, Leith, and Dennistown Ropework, Glasgow, per James Managing Partner. (Trawl Gear Store for North Sea Fisheries, 52 Queen Street. (1) Manila Trawl Warps, Bridles, Dandies, Small Warps, Hauling Lines, and B Gear. Fine Yarn Rigging Hanyards and Ratlines. Improved Herring Net Warps in and in Manila. Canal Horse Lines, Whale Lines, Fishing Lines, and Twines. (2) S Storm extra, Star extra, Castle, and Atlas.

17. **BOYES, WILLIAM,** Cooper, &c., 28 High Street, Pa London, S.E. (1) Set of Bowls, &c., Sizes 8½ × 12, 9 × 13, 10 × 14 inches, and O Work, as used on board Boats and Smacks in Fishing.

**G. SAMSON AND SON,**
ENGINEERS AND IRONFOUNDERS,
MAKERS OF FISHING NETS AND TWINE - MAKING MACHINERY.
GROVE IRON WORKS,
BRIDPORT, DORSET, ENGLAND.

3. **LACEY, LINCH, & SON,** Custom House Station, Victoria Docks, Goulden Street, Battersea, London. (1) Blocks fitted with non-setable Sheaves, which lso suitable for blocks of all kinds, viz., Fishermen's Trawl Blocks, Snatch Blocks, &c. 'ole-end Slips for releasing tugs, &c.; cannot get out of order, strong and serviceable, no gs, cheapest and best to be had.

). **PATERSON, WILLIAM,** 5 High Shore, Macduff, N.B. Collec- f Long Line Gear, complete.

). **BROOKS, C. & R.,** 10 Edgcumbe Street, Stonehouse, Plymouth. llines, Long Lines, and Artificial Sea Baits, &c. The Handlines and Long Lines are for se of Yachtsmen, with railing, Lines for Mackerel, and Horsehair Drift Lines for Bass. ther with all kinds of Light Gear for Boatfishing.

I. **TARRY MILL COMPANY,** per John Muckart, Tarry Mill, by oath, N.B. Collection of Long Lines, Handlines, and Snooding. Collection of Long Gear complete.

2. **MURRAY, ALEXANDER,** Fisherman, Lossiemouth, Morayshire et for containing baited fishing line.

3. **ROSS, JOHN, JUN.,** Muchalls, near Stonehaven. Fishing Lines, as by the fishermen on the "Finnan Coast" of Kincardineshire.

3*a*. **BARTLEET, B. C.,** Ramsgate. Samples of Manila and Hemp Twine.

4. **STRACHAN, WILLIAM,** 29 Main Street, Inverallochy, Aberdeen-, N.B. Handline with flies for Sea fishing, Herrings, &c.

5. **EDINBURGH, H.R.H. THE DUKE OF, K.G.** (1) One Net mmel, Silk, 60 yards. (2) One Net Trammel, Twine, 85 yards. (3) Horsehair Fishing s.

26. **HOUNSELL, HERBERT E., Limited,** Pelican Twine and Net ks, Bridport, Dorset. (1) Patterns of Fishing Lines and Twines. (2) Patterns of Netting whole Nets—complete, for Sea Fishing. (3) Models of Fish Traps.

27. **ROUTLEDGE, W., & SON,** 219 Gallowgate, Aberdeen. General itment of Fishing Gear. All hand-made.

8. **HOUNSELL, WILLIAM, & CO.,** North Mills, Bridport. Nets, s, and Twines for Sea Fishing.

9. **BUIK, J. H., & CO.,** South Rope Works, Wick. Herring Nets and ng Lines.

). **JONES, W.,** 10 Eastbro, Scarborough. (1) Case of Sea Fishing le, Rods, Reels, Lines, Hooks, Baits, &c., &c. Special Sea Rod, with Improved Wheel (2) Case of Fitting for Herring Nets and Boats, Nozzles, Head Seam, Net Rope, ings and Barrel Strops, Lead Lines, &c. (3) Case of Twines for Trawl and other Nets, Lead Lines, &c., &c. (4) Model Blocks, Dead Eyes, Trucks, &c. (5) Cases of Lines in Deep Sea Fishing, Cod Lines, Haddock, Sole and Whiting Lines, with Hooks, &c., lete. Also Hand Lines and Hooks, complete. (6) Model of an improved Trawl Net, ing how the Net will allow small and immature fish to escape, also refuse. (7) Model of proved Herring Net.

. **MACKAY, ANDREW,** 8 Crook o' Ness Street, Macduff, N.B. One ing Net, complete, ready for sea.

2. **CORNWALL COUNTY COMMITTEE.** Nets, Lines, Lobster and Gear of every description. (For details see page 116.)

3. **IRVING, WILLIAM,** Loch Fishery, Annan, N.B. Model of Stake Net.

4. **READ, GEORGE,** Byrom House, St. Patrick's Road, Deal, Kent. Trawl Net, Stow Net, Trawl Shrimp Net, to allow immature fish and refuse to escape from, by a very simple and inexpensive method. With improved gear for boarding the Net and Shrimp Net. (2) Model of a Sailing Trawler. (3) Self-acting Helm Signals rded £200 by Admiralty). (4) Diagrams, framed and glazed, to illustrate signals for

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ships, tidal harbours, pierheads and dockheads. (5) Flash Lights for Fishermen to municate their wants on shore or afloat to Steam Carriers, &c. (6) Signalling by da night for fishing fleets and vessels.

35. **FINDLAY, GEORGE,** Whitehills, Banff, Scotland. (1) He Net hung according to rule, so that every mesh is a uniform square (with plan). (2) Line for Haddock Fishing. (3) Lobster and Crab Pot, allowing the undersized to escap

36. **FLETT, JAMES,** Queen Street, Branderburgh, Morayshire. He Net, trimmed.

37. **WILSON, HENRY,** 32 Southside Street, Plymouth. (1) Tw of Td. Manilla Bridles. (2) Td. Manilla Dandy Span. (3) Td. Manilla Net Wa Td. Russian Net Warp. (5) Set of Trawl Twine. (6) One Td. Manilla Trawl Rhod yarn, hard laid as used in the West of England. (7) One Td. Manilla Trawl Rhod yarn. (8) Td. Manilla Rope. (9) Wh. Manilla Cordage. (10) Two Coils Wh. Cordage (fine). (11) Td. Russian Cordage (fine). (12) Bolt Rope. (13) Td. Russia

38. **SHEPHERD, H. C. W.,** Hull House, Raglan Street, Lowestoft. Model Deep-Sea Trawl Net, with beam and heads complete, with Apparatus to demo Net has turned over. (2) Model Boat for carrying fish from catcher to carrier.

39. **BROOKS, H. F.,** 60 South Quay, Great Yarmouth. Quarta Model of a Yarmouth Trawler's Gear, consisting of Beam, Heads (registered specially Trawl-warp and Bridles, suitable size for a small yacht.

39*a*. **CRAGG, J. S.,** Net Manufacturer, Lowestoft. (1) Collecti Mackerel Nets, complete. (2) Collection of Herring Nets, complete. (3) Collection o Nets, complete. (4) Drift Salmon Net, complete. (5) Brat or Turbot Net, comple Tramel Nets, complete. (7) Bowls and Buoys for Surface Drift Fishing. (8) Colle Cotton, Linen, and Hemp Twines. (9) Collection of Nets in all states of manufacture.

40. **SCHREIBER, CARL G. VON,** St. Margaret's College, Low (1) Model and Drawing of an Improved Trawl-net, capable of allowing immature fi refuse to escape therefrom; together with a piece out of the cod end of a full-size Net, showing the practicability of fitting up Old Nets with means of escape for im fish and refuse, without going to the expense of having entirely new cod ends made f purpose. (2) Plan of proposed British Canal across the Isthmus of Suez, from Po Gulf to the Red Sea in a direct line, terminating either above or below the wells on the shores of the Red Sea.

41. **BEESON, WILLIAM L.,** 78 Sterling Street, New Clee, Gri Model of Deep Sea Trawling Gear on an improved scale.

42. **THOMPSON, PETER,** 9 High Shore, Macduff, N.B. (1) Colle of Long Line Gear Complete. (2) Model of Drifter for Herring Fisheries.

43. **DAVIDSON, GEORGE & WILLIAM,** 18 Regent Quay, Aber (1) Model—White Fishing Beam Trawl Net. (2) Samples of Net Twines made of H Cotton, and Flax. (3) Samples of Fishing Lines. (4) Cordage for Nets.

44. **SPEEDIE, ALEXANDER.** Salmon Net.

45. **RICHARDSON & FLETCHER,** 5 Beresford Place, Dublin. Herring-net Floats for Scotch Fishery. (2) Herring-net Floats for Irish Fishery. Mackerel-net Floats. (4) Pilchard-net Floats. (5) Salmon-net Floats. (6) Hake-net F (7) Floats chemically prepared to resist the action of the water. (8) Corkwood a material for Floats.

46. **PATERSON, ANDREW,** 6 High Shore, Macduff, N.B. (1) Mark Line, complete. (2) "Murderer" for catching Codfish. (3) Hand Trap for catching C and Lobsters at foot of rocks.

46*a*. **PATERSON, ALEXANDER,** 8 High Shore, Macduff, N.B. Ha line Gear, complete.

47. **LESLIE, JOHN,** Ropeworks, Macduff. Collection of Long Li Hand Lines, and Snooding.

KNOWLES AND KNOWLES,
HULL.
*Awarded Six Prize Medals and Special Prizes*
FOR
ROPES AND TRAWL NETS.

**[OMPSON, HARTLEY,** Girvan, Ayrshire. (1) Brat Net. (2) ie.

**;MMING, T., & SON,** Windsor Mills, Redditch. Lines, Hooks, &c.

**:NOLD, JOHN WILLIAM,** 9 Park Street, Deal. (1) Mackerel Herring Net. (3) Sprat Net. (4) Trammel Net. (5) Hand Line for Whiting (6) Lug Fork as used in this locality for digging large Lugworms used as a favourite iiting, Pouting, Codfish, &c. (7) Cockle Rake used by the small boys in gathering ıms, &c., at low water time in this neighbourhood.

**NES, JOHN,** Queen Street, Filey, Yorks. (1) Sample Balls of for Herring Nets, in Russian Hemp, Manila, and Cotton. (2) Nozzles for Herring ınila and Cotton, (3) Lead Lines. Lead and Log Lines. (4) Hand-spun Cod Smaller size for Haddock. (6) Line for Sole Catching by Hooks, (7) Tow or Lines. (8) Samples of Snooding for the above Lines in Hemp and Cotton. (9) ı. (10) Sample Coils of Rope for Herring Nets. (11) Sample Coils of Rope for gs and Strops. (12) Manila and other Twines for Crab and Lobster Pots. (13) ınd Crab Pot complete.

**)RDYCE, JOHN,** Gardenstown, Banffshire. One Greatline placed ; about 24 in. diameter, and from 12 to 18 in. deep. The Hooks and Strings he basket in the same position as that adopted by the fishermen on the North-East )tland in the capture of Cod and Ling.

**NTON, ANDREW,** 87 High Street, Edinburgh. Cork Net Floats ıg purposes.

**UART-WORTLEY, COLONEL,** Rosslyn House, Grove End 'atent Museum, South Kensington. Various Fish Hooks, Spears, and Floats, from in the Pacific Ocean. Brought home by Exhibitor, who has had most of them

**[CHANAN, JAMES,** 58 to 62 Dale Street, Tradeston, Glasgow. ;h Hooks for Home and Foreign use ; also, as agent for S. Laycock & Son, Sheffield. )ressed Hair for Fishing purposes.

**EEDMAN & McALLISTER,** Cathcart Street, Glasgow. (1) A Fishing Floats for Long Lines, &c. (2) Cork Fenders for Fishing Boats in Hemp. enders for Fishing Boats in Manila Rope. (4) Cork Fenders for Fishing Boats in

**[ARP & MURRAY,** Cellardyke, Fifeshire. (1) Collection of ıts, complete, as used on the British Coast. (2) Collection of Bowls, Buoys, and ır Drift or Surface Fishing. (3) Collection of Deep-Sea Fishing Gear, complete for Halibut, Haddock, &c., with Sculls and Maunds used for same. (4) Collection of Gear, complete. (5) Crab and Lobster Pot.

**NES, CAPTAIN A. J.,** 2, Sandown Terrace, Chester. (1) Two ;s. (2) Trammel Nets. (3) Mussel Dredge. (4) Two Coracles. (5) Model of g Boat.

**JEE, HENRY,** Margate. (1) Eskimo Click-hook for taking fish. Bait for Seals. (3) Tonga Island Fish-hooks and Spinning-baits.

*le* 153). **WHETHAM, S., & SON,** 40 Gracechurch Street, London, Bridport, Dorset. (1) Extra Flax Double, Half Bleached Double, and Double 2) Patent Seaming and Roping Twines. (3) Salmon, Seine, Codnent, and nes. (4) Cotton Herring and Mackerel Nets for English, Irish, Norwegian ;oasts. (5) Cotton and Hemp Salmon Nets. (6) Cotton and Hemp Sprat Nets. , Smelt, Whitebait and Shrimp Nets. (8) Mackerel and Cod Lines, Snoods and (9) Shuttle, Barrel, and Round Corks. (10) Corks for Lance, Caplin and Cod 1) Dressed Flax and Hemp. (12) Herring and Mackerel Nets, tanned and fitted se.

---


# EWENS AND TURNER,

## RIDPORT, DORSET.

MANUFACTURERS OF

***Hemp and Cotton Fishing Nets;***

***l, Caplin and Herring Seines, Fishing Lines, Twines, etc.***

58c. **GERHARD HAAS,** Cleve, Germany (Messrs. Chas. Atkins Nisbet, 1 Water Lane, Gt. Tower Street, E.C., Agents). Awarded Prizes, Greifswald, (Austria); Cleve, Gold Medal. (1) One Packet Treble-threaded Yarn for winter salmo (2) One Packet Treble-threaded Yarn for summer nets. (3) One Packet Double-th Yarn for drawing nets. (4) One Packet, ditto, ditto. (5) Three Rods (Leinen) for nets, middle net and two side nets, for a salmon driving net. (6) One Packet Rough used for making the yarns. (7) One Packet, Improved Hemp, used for making the yarn articles are hand-made.

DIVISION II.—[*Deep Sea Fisheries Gallery.*] *See Plan, p. 8.*

**Oyster dredges, crab, lobster, prawn, &c. pots, and other pliances for catching fish of this description.**

59. **SOFTLEY, R. T.,** Central Works, King Street, Great Yarm Improved folding Crab and Lobster Trap.

60. **THOMPSON, HARTLEY,** Girvan, Ayrshire. (1) Crab (2) Lobster Pot.

61. **PLUMMER, LEWIS,** Mast Yard, Sandside, Scarborough. improved Crab or Lobster Pot, made so as to allow small or undersized crabs to esc can be baited from either top or bottom, and requires no weight to sink it.

62. **LEVACK, DONALD,** Aukengill, by Wick, Caithness, N.B. Lobster Pot.

63. **DAMON, ROBERT,** 4 Pultney, Weymouth. Improved dre Mollusca, &c.

64. **HOGARTH ROWLAND,** Saltcoats, near Manchester. Lobst and Fishing Line.

65. **ASCROFT, ROBERT LAMB,** 17 Barratt Street, Southport. Hand Shrimp Net. (2) Shank Net or Shrimp Net, to be used from a boat. (3) Model S ing Boat, showing how four shrimp nets are worked.

66. **HURD, RICHARD,** 6 York Buildings, Eastbourne, S Prawn Nets.

67. **RITCHIE, WILLIAM,** 9 Mid Street, Rosehearty, Aberdee Lobster Pot, made by Exhibitor.

68. **SAUNDERS, GEORGE,** Fisherman, Selsey, Chichester. (1 improved Lobster Pot, so constructed as to permit the small lobsters to escape. ( improved Prawn Pot. The above articles are constructed partly of willow, and partly vanised wire, and are specimens of pots which have been actually used by Exhibitor.

69. **PERRIN, CHARLES,** Selsey, near Chichester, Sussex. W Prawn Pots.

70. **PATERSON, GEORGE,** 4 Market Street, Macduff, N.B. Cra Lobster Pot, model, new design.

71. **KING, GEORGE HOADLEY,** Sea-Horse House, 165 Great Port Street, London. (1) A Folding Dredge. (2) A portable folding Washing Tray for the gentlemen dredging. (3) A set of Sieves, two Pinna Shells, and a set of Corals dredge Weymouth Bay, and Mediterranean Coral (*Carofila verocosa*).

72. **IDE, WILLIAM,** Fisherman, Bognor, Sussex. Lobster Pots.

73. **THOMAS, J. J., & CO.,** 87 Queen Victoria Street; 285 & Edgware Road, London, W. (1) Galvanized Wire Lobster and Crab Pots, so made allow of the ready escape of all undersized Lobsters and Crabs. (2) Galvanized Wire Pots. (3) Eel Traps, galvanized wire.

74. **THOMSON, WILLIAM,** 8 Lowshore, Macduff, N.B. Crab Lobster Pot or Creel.

The Best and Cheapest. First Established 1825.

**NEAVE'S FOOD** FOR **INFANTS AND INVALIDS.**

IN ONE-POUND ONE SHILLING CANISTERS.

SOLD EVERYWHERE. WHOLESALE, OF THE MANUFACTURERS

**J. R. NEAVE & Co., Fordingbridge, England.**

5. **WATT, CHARLES, JUN.**, Pennan, Fraserburgh, N.B. (1) Lobster or Trap.

6. **SCHREIBER, CARL G. VON**, St. Margaret's College, Lowestoft. Lobster and Crab Pot, permitting the escape of those undersized. (2) Model of a Life-ng apparatus and Sea-Chest.

7. **MANN, T. J.**, Bishops Stortford. Lobster and Crab Gauges.

7*a*. **GRIMSBY COAL SALT AND TANNING COMPANY.** r details see No. 14*f*, p. 10.)

DIVISION III.—[*Deep Sea Fisheries Gallery.*] *See Plan, p.* 8.

**Steam fishing vessels and steam carriers.**

8. **LARKIN, SAMUEL,** 12 Billingsgate Market, London. Model of w Trawler and Carrier.

9. **SIMS & TOOZES,** 10 Park Street, Hull. (1) Full Model of a Deep Trawler, 85 tons with Trawl complete, and fitted with Steam Capstan in working order. Models and Drawings of Steam Fishing Vessels and Carriers under 5 HP. (3) Full del of a Steam Screw Trawler and Carrier.

0. **BEAVOR-WEBB, J.** (N. A.), R. T. Y. C., 7 Albemarle Street, London, (1) Model of Steam Trawler, 95 ft. L. W. L. (2) Model of Steam Carrier, 120 ft. W. L. (3) Model of Herring Boat.

1. **HAWTHORNS & CO.**, Leith, N.B. (1) Case containing Models. Half Model of Iron Screw Trawlers, length 92 ft., breadth 18 ft., depth 9½ ft., for the eral Steam Fishing Company. (3) Half Model of Iron Screw Steamer for carrying cured ings in barrels, length 82½ ft., breadth 18 ft., depth 9¼ ft. (4) Half Model (Iron) of Screw , length 70 ft., breadth 15 ft., depth 8½ ft. All fitted with compound surface condensing gines.

81*a*. **WARD, T. WILSON,** St. Margaret's College, Lowestoft. Model of a -sailing Steam Yacht which might be used as Dispatch Boat between Fishing Fleets and Ports.

82. **BRITANNIA STEAM SHIPPING COMPANY, Limited,** John vill, Manager, 4 Princess Terrace, Scarborough. Model and Half-model of a Steam wler.

83. **BROWN, ALFRED H., A.I.N.A.,** Naval Architect, 1 Waterloo Place, ll Mall, London, S.W. Half Model of Steam Trawler and Carrier, combined on Back nd. Also Lines of the same, in frame, glazed.

83*a*. **FLEMING, JAMES,** 10 Grant Street, Inverness, N.B. Model team Ship.

4. **JONES, E. PERCY S.,** Rother Iron Works Company, Limited, Rye, ex. Model of Steam Trawler.

4*a*. **GEARING, ARTHUR,** 12 Werrington Street, N.W. Working el of Steam Trawler.

5. **METAXA, COUNT AND COUNTESS,** 9 Norwood Terrace, ssea. (1) Model of Steam Trawler, fitted by G. S. Wells, L.R.C.S. (2) Specimen of a eaving Waistcoat for Fishermen: invented by the Count Metaxa. (3) Model of old ish Sailing Frigate mounted on Shells.

6. **FELLOWS, H., & SON,** Great Yarmouth. (1) Half-model of Steam ing Vessel. (2) Plan of Steam Fishing Vessel.

7. **MARKS, WILLIAM,** 6 Highbury Quadrant, Highbury New Park, don, N. (1) Steam Fishing Vessel. This Vessel, owing to its many air-tight revolving rs, is of sufficient buoyancy to admit railway trucks on deck for the convenience of packing It also has large reservoirs for preserving the Fish alive. The proposed breadth is ft. and length 200 ft. (2) Steam Life-boat. Constructed not only to save life, but from

Elastic Stockings, Knee Caps, &c., give great support in cases of Weakness, Varicose Veins, and Sprains.

ANDERSON ABBOTT, AND ANDERSON'S

Ice Bags. for the Head and Spine. Waterproof Bed Sheeting, Travelling Conveniences, Syringes, Accouchement Sheets, Belts, and Braces.

its great buoyancy (obtained by the many revolving air-tight rollers acting as propellers), w
help to support a ship from sinking and tow same into port. The Life-boat contains
space for salvage, &c., also when at anchor could serve as a revolving lightship.

**88. SWINBURNE, THOMAS A.,** Eilan-Shona, Salen, Ardgour, N.
(1) Model of Fishing Lugger, with Auxiliary Screw, adapted for Drift-Net, Long Line
Trawl; Masts to lower: Balance Lugs; Capstan and Windlass to be worked by St
(2) Model of Improved Yawl for Line or Drift-Net Fishing, Masts to lower; Balance
Light Draught, with Centre Board. (3) Model of Fishing Boat for East Coast, Scot
Improved Rig, Balance Lugs. (4) Model of Improved Mule Coble for Herring Fish
Cleaver Centre board, Triangular Balance Lug. (5) Model of Boat, with Lug Sail to
without lowering. (6) Model to show method of raising and lowering foremast of lu
reefing mizen mast and locking rudder. (7) Patent Anchors (two brass models).

**89. LONG, JAMES,** 12 & 14 Southwark Street, London Bridge. Unsi
able Metal Steamboat.

**90. ROSS & DUNCAN,** Engineers and Shipbuilders, Whitefield Wo
Govan, Glasgow. (1) Photograph of Engines of Steam Trawler. (A.) This shows the
of Engine best suited for vessels of somewhat narrow beam, as the condenser tubes, when
are removed, are drawn out in the fore and aft direction. (2) Photograph of Engines of St
Trawler, Improved Type, with Direct-Acting Pumps. (B) These Engines have very
working joints, all the pumps being worked direct. This saves wear and tear and attend
Somewhat greater width of beam is required than in the (A) arrangement. (3) Photogra
of Engines of Steam Trawler, latest type, Duncan's patent, reversing by a valve. (C) T
Engines are of the greatest possible simplicity, and can be worked without skilled la
Instead of having link motion or other complicated gear, the reversing is done by
They have only one eccentric instead of four, and fifteen fewer working joints than (A) or
They are specially adapted for small craft. (4) Duncan's Patent Propeller. The blad
these propellers are formed by a combination of curves designed to give great forward th
They are of special efficiency where there is extra resistance to the motion of the vessel.

**90*a*. McLACHLAN, WILLIAM, & CO.,** 42 East Clyde St
Glasgow. Two Models new Iron Screw Steam Fish Carriers, specially adapted for the
capable of receiving cargo at sea from six fishing boats at one time, three on each
exceptionally powerful engines for fast steaming.

**91. GRIFFITHS, ROBERT,** 54 Gresham Street, London, E.C. Mod
of sterns of Screw ships, on stand, showing arrangement for protecting the propeller of S
Steam Trawlers, which has been applied to the "Sir Charles Whetham" tug at Milford
very satisfactory results, and will be used by the Nationel Fishery Company, and also
of increasing the speed of Screw Carriers.

**91*a*. SIDDELL, JOSEPH,** Sunderland. Model of Steam Trawler.

**92. JARVIS, W.,** Ship and Boat Builder, Anstruther, N.B. St
Trawlers and Fishing Vessels; also Fishing Vessels other than steam.

**93. ALLAN, D., & CO.,** Shipbuilders, Granton, near Edinburgh.
lection of Models of Steam Fishing Vessels, showing models of first successful Fishing St
in Scotland and in Spain, viz., Model of Mamelena: 1st, Model of Mamelena, 2nd, Ma
3rd, Gannett and Granton, all adapted for drift net, line-fishing, trawling and carrying
Model which gained the Gold Medal at Edinburgh Fisheries Exhibition in 1882.

**94. BLAKE, A. W. & H. P.,** Great Yarmouth and Lytton
Leytonstone, London, E. (1) A Half-model of a Steam Screw Trawler, 75 ft. × 2
× 11 ft., adapted for the North Sea or other fishing. In designing, the object kept
has been upon minimum dimensions to secure maximum results, among the advantages
small boat we have, 1st. Moderate original cost, 2nd. Adaptability to small harbours, 3rd
working expenses. (2) Descriptive Drawing of the above, showing Elevation, Deck
Plan of Hold, Engines and Boilers, &c. (3) Sail Plan of the above.

**94*a*. BELL, E.** Model of Steam Trawler.

**CHAINS, CABLES, ANCHORS, GRAPNELS, HARPOONS,**
AND EVERY DESCRIPTION OF
SHIPPING TACKLE AND BOAT IRONWORK, WOOD AND IRON
BLOCKS AND WINDLASSES.
**TOMPSON AND CO.,**
*PATTERN ROOM:* 4, BROAD STREET BUILDINGS, E.C.
(*Facing Broad Street Station*); and DUDLEY.
IMPORTERS OF AMERICAN ASH BOAT OARS. SHIP LAMPS.

. **WOODGER, HENRY LAMBLE,** 9 Haddo Terrace, Scarborough, Full-rigged model of Screw Steam Trawler, now working out of the port of rough.

. **INGRAM, R.,** Brock Farm Cottage, North Shields. Working Model oposed Screw Steam Trawler, built of Polished Zinc and Plated, fitted with Engine and 105 ft. on Load Line, 112 ft. 6 in. over all, Beam moulded 20 ft., depth 11 ft. 6 in., Scale 1 foot. Illustrating a means of securing solid water for the Propeller to work in, and al guarding from fouling the Trawl and Tow Line, and no hindrance to the speed of the er.

DIVISION IV.—[*Deep Sea Fisheries Gallery.*] *See Plan, p.* 8.

**Fishing vessels, and boats other than steam vessels.**

*From considerations affecting the apportionment of space, it has been found necessary nde in the British Deep Sea Fisheries Gallery, containing, among other Divisions, Division so boats used for Fresh-water Fishing (Division XX.)*

. **IRVINE, FRANCIS,** 14 Skene Street, Macduff, N.B. Four Models Rigged. (1) The "R. W. Duff" with Sweeping Mast and Screw Propeller, driven by capstan, with safety rail, can be used in section, simple, efficient, and cost little. (2) n Asher" Smack Rig with Sweeping Mast and safety rail, entirely out of the way when new design of Steering Gear. (3) "Macduff" new build, with new design of Rig, the oes not require to be dipped in beating to windward, possessing the advantages of the Sail without the dangers of it. (4) "W. E. Gladstone" Trawler or Fish Carrier, the ngs on Deck are for stowing the Fish into the different compartments.

. **HODGSON, J. W.,** 48 Redbourne Street, Hull. Complete Model of Fishing Vessel, built and fitted up strictly on a scale of ½-in. to 1 ft. Dimensions 80 ft. ft. by 10 ft. Showing Fish-room, Engine-room, and arrangement for working capstan eam Power, &c.

. **HOAD, JAMES C., JUN.,** Rye, Sussex. Model of the North Sea er, "City of London," of Hull, by ¾ in. scale. Launched February, 1883.

. **PETERKIN, J. C., & CO.,** Rope and Sail Makers, Lossiemouth, Zulu Boat, rigged with Sails.

. **BANKS, GEORGE,** 1 Henrietta Court, St. Thomas Street, rough. Model of a North Sea Trawler, complete, fitted up inside, with Cabin, Fish Ice Room, Warp Locker, and all requisites, &c., complete.

. **ROSHER, CHARLES HENRY,** 23 Fulham Park Gardens, n, S.W. (1) Eskimo Kayak (canoe), Paddle, Boathook, Seal-harpoon and line. The of the Kayak is constructed of wood fastened with thin strips of hide and sinews, and it red with sealskin, sewn with reindeer sinews. The head of the harpoon is made from a tooth, and the line of walrus-hide. (2) Sealskin boots and mittens.

. **FORRESTT & SON,** Norway Yard, Limehouse, E. (1) Full-Coble as used on North-East Coast. (2) Working Model of Marine Engine and ery complete.

. **HAMILTON, DANIEL,** Upper Main Street, Dunbar, N.B. Model ting Boat.

. **YOUNG, SIR ALLEN,** 5 St. James Street, London, W. A Sledge at, with travelling equipment for long journeys over the ice, as supplied to the relief Hope."

. **ROPER, RICHARD,** 143 Lewisham High Road, New Cross, S.E. shing Punt, with fluted bottom, built on the cellular (unsinkable) principle, suitable


# LADIES' LEVE ANTIPLUVIUM CAPES.

**For the Pocket. Only 10 ozs. in Weight.**

# ANDERSON, ABBOTT, AND ANDERSON,

India-Rubber Manufacturers, 37, Queen Victoria Street, London, E.C.

for rivers, lakes, &c., fitted with cabins for sleeping, cooking, &c., and tanks to hold f Scale, 1 inch to 1 foot. (2) Fishing Punt, on the same principle, without cabins; suitable small lakes, small ponds, &c.; fitted with tanks for fish, lockers, and umbrella tent, and s Scale, 1 inch to 1 foot.

**107. SHARP AND MURRAY,** Cellardyke, Fifeshire, N.B. Models.

**108. METCALF & WOOD,** Albert Dock Locks, Hull. (1) Compl Model 80-Ton Sailing Trawler, fitted up with all the latest improvements, fishing gear (2) "Boat," 17 ft. long, 7 ft. beam, for conveying fish from the smack to the steam cutter

**109. LEIGH-SMITH, R.,** 64 Gower Street, London. Boat of the Yacht "Eira," in which Exhibitor retreated to the Coast of Nova Zembla, after winter Franz Joseph Land, and rescued by the "Hope." Distance traversed, about 800 miles, ch through pack ice. Time occupied on journey, 43 days.

**110. BURGOINE, C. & A.,** Kingston-on-Thames, Surrey. (1) Model Boat with handier and safer rig than the ordinary Lug Sail, not requiring to be dipped every tack in beating to windward. (2) 14 ft. Model Boat with well for Fishing and suff draught to beat to windward. Rigged with improved Balanced Lug and Mizen, with Reefing Gear. (3) Model of Improved Tackle for management of Tug and other Sail Board Small Fishing Craft. (4) Fishing Boat for Rivers or Lakes, 24 ft. (5) Thames S with fish-well, wet or dry at pleasure, fitted with screw plug and pump.

**111. ANDERSON, ABBOT, & ANDERSON,** 37 Queen Victo Street, London. Portable India Rubber Boats.

**112. JEANS, JOHN,** 57 North Street, London, Poplar, E. (1) Model Life-boat, "Torry Burn." Propelled by Screw. Length 30 in. (2) Model of Ship's F nace, "Wind Jamer of Aberdeen," to go by Windmill, utilising the wind, thus ensuring safety of lives when launched from ship. Length 30 inches. (3) Model of Herring B "Betty Allen of Foot Dee." Propelled by screw when required. Length 30 inches.

**113. BAXTER, ALFRED,** Fish Docks, Grimsby. Boat for Cod-Fishi Vessel.

**114. CORDING, GEORGE,** 125 Regent Street, and 231 Stra W.C. (1) India Rubber Portable Boat for Lake Fishing, &c. (2) Portable Collapsible B

**115. BEECHING BROTHERS,** Ship and Boat Builders, Gre Yarmouth. Boat for Conveying Fish from Catcher to Carrier, adapted for saving the lives the crew.

**116. BURDETT-COUTTS, W.,** 1 Stratton Street, Piccadilly, London, W A Greencastle Yawl, used for fishing off part of the coast of County Donegal, fully rigged 24 ft. by 7 ft.

**117. HAMILTON, THE MARQUIS OF,** 2 Belgrave Square London, W. (1) A Tory Island (co. Donegal) Curragh, used in fishing, full size, 15 ft. by 5 (2) A Dunfanaghy (co. Donegal) Curragh, used in fishing, full size, 15 ft. by 5 ft. (3) Lo Line and Mackerel Hand Line, as used in Sheephaven Bay, county Donegal.

**118. SAYER & CO.,** 100 Lower Thames Street, London, E.C. (1) A Kerry Curragh, used off counties Clare and Kerry in fishing, fully rigged, 28 ft. by (2) A Gweedone Curragh, used in fishing, full size, 15 ft. by 5 ft. (3) A Boyne Curra used on river Boyne in Salmon fishing, full size, 4 ft. by 4 ft.

**119. STEPHEN, WILLIAM, & SONS,** Shipbuilders, Marine Parade, Dundee, and St. John's, Newfoundland. Whaleboat, fully equipped with guns, lances, &c. ready for use.

**120. MUNDAHL, C. M.,** Fish Docks, Grimsby. (1) Codman's Boat. (2) Whelker's Boat.

**121. AYLING, EDWARD,** Auckland Street, Vauxhall, S.E. Oars, Sculls, Paddles, &c., in the rough and manufactured states.

**122. WRIGHT, J. P.,** 3 Park Road, Red Hill, Surrey. (1) Collapsible Dinghy, cork and wood sides, canvas waterproof bottom, protected by an outer bottom of wood

**C. & A. BURGOINE,**

**YACHT AND BOAT BUILDERS TO HER MAJESTY,**

**High Street, Kingston-on-Thames, and at Hampton Wick.**

**24 Ft. MAHOGANY DOUBLE SCULLING SKIFF,** with Well (wet or dry at pleasure) fitted with Perforated Plate and Screw Plug, and Brass Adjustable Pump. Sculls, Oars, Balance Lug Sail, &c., **£45 0s. 0d. 24 Ft. MAHOGANY PUNT,** with Fish Well. Cane Back Rail Cushions, Gratings, Luncheon Basket, **£31 10s. 0d. 15 Ft. OPEN SAILING BOAT** of Light Draught, fitted with Balance Lug Sail, with Simple Reefing Gear, a great improvement on the ordinary lug sail, does not require dipping in going about and is a safer and hardier rig for any Boat (open especially.) **26 Ft. CEDAR FOUR-OARED GIG,** kindly lent by G. F. Duncombe, Esq.

ding Canadian Canoe, cork and wood as above. (3) Folding Inflatable Canoe. Weight Size, open, 7 ft 6 in. by 30 in.; folded, 28 in. by 14 in. by 9 in. (4) Folding Shooting hing Punt, 16 ft. by 3 ft. 9 in.; folding to, 6 ft. long. (5) Ditto, 10 ft. by 3 ft.; folding long.

. **BERTHON BOAT COMPANY, Limited,** Works, Romsey, hire; London office, 72, Aldersgate Street, E.C. (1) Collapsible Insubmergible Ding- Fishing Smacks, which, being stowed in so small a space, afford a means of refuge in distress. This Dinghy is 12 ft. long by 4 ft. 2 in., but it can be made of any size and form. It will live in any sea, and will not sink when filled with water. (2) Collap- oats for Fishing and Shooting on Rivers and Lakes. (3) Collapsible Boats, 7, 9, and ng, for Fishing, Shooting, &c. The 10 ft. boat is bipartite, or made in two parts for nvenient transport, one half being carried on each side of a pony. (4) Canoes for Pad- Sailing, and Duck Shooting. (5) A 22 ft. Berthon Lifeboat collapsed between davits ip's side, showing how any amount of the very best and safest boats can be carried by p without inconvenience. These are unrivalled sea boats, and excellent sailers. They itomatically in a few seconds, and are far less liable to injury in the act of lowering mmon boats.

. **MEITER, C. W., & CO.,** 87 Gracechurch Street, London, E.C. hing, Shooting, Pleasure, Life-Saving Portable Boats, manufactured under Colonel de a's patent. (2) Unsinkable Waterproof Fishing Garments, and other Life-Saving nces.

. **LIGHTFOOT, CHARLES,** 19 Dover Street, Sittingbourne, Kent. of a Smack fitted as a Stow-boat. Model of a Cod Smack.

. **WISEMAN, FREDERICK,** Paglesham, Rochford, Essex. Model nimaux Fishing Boat.

. **FELLOWS, H., & SON,** Great Yarmouth, Norfolk. (1) Plan of Trawler and Carrier. (2) Model of a Drift Fishing Boat, for North Sea and other s, with steam capstan.

. **SAILORS' HOME,** Cape Town. Model of a Fishing Schooner.

. **SHIPWRECKED FISHERMEN'S AND MARINERS' ROYAL EVOLENT SOCIETY,** Hibernian Chambers, London Bridge, S.E. atement of Objects of the Society, with Statistics of its work. (2) Frames with onials, Forms, &c. (3) Annual and Quarterly Publications. (4) Serial issues and lets. (5) Gold, Silver and other medals. (6) "Grace Darling" boat, as memorably y that heroine (6 Sept. 1838). Lent by Mrs. John Joicey. Life-size Portraits of Darling and her Father. (7) Picture of the "Rescue of the Survivors of the 'Forfar- " (8) Engraving of the same subject. Lent by Mr. G. H. King, Sea Horse House. ies of Photographs of rescued vessels, exemplifying terrible effects of numerous notable ns. Lent by Fletcher, Son, & Fearnall. (10) Autograph Letter from Grace Darling. y G. G. Grant.

. **ALBERT DOCK SHIPWRIGHT, BOAT BUILDING, AND T AND BLOCK-MAKING CO., Limited, HULL,** George F. s, Manager. Deep-Sea Trawler's Boat for conveying Fish from Catcher to Cutter.

. **GUNN, JOHN,** The Hermitage, Golspie, Sutherlandshire. Guard for Fishing Boats and other vessels. Gunn's patent, fitted on model of gunwale of Scotch boat. This movable folding guard rail is intended to prevent the great loss of life caused h men falling or being washed overboard from all classes of vessels having low bulwarks.

. **SEARLE & SONS,** Stangate, Lambeth, London, S.E. (1) A River g Punt. (2) A River Fishing Gig. (3) A River Skiff-headed Fishing Punt. (4) of the last State Barge built for the Lord Mayor of London (loan).

. **MESSUM, E., & SONS,** Lansdowne Boat House, Lower Road, ond, Surrey. (1) A Mahogany Fishing Punt. (2) A Mahogany Lake Punt, suitable ing or fishing. (3) An Oak Fishing Gig. (4) "Specialité" Pleasure Skiff, fitted with silver fittings and all the Exhibitors' latest improvements.


**PASCALL ATKEY & SON,**

*Yacht Fitters and Stove Makers,*

ALSO MANUFACTURERS OF

**EVERY DESCRIPTION OF SHIP WORK AND FISHING GEAR.**

**West Cowes, Isle of Wight.**

134. **DOCKAR, ALEXANDER,** Garmouth by Fochabers, N.B. Mod of Fishing Boat.

135. **EDINBURGH, H.R.H. THE DUKE OF, K.G.,** Clarence Hou St. James's, London, S.W. Carved Figure-Head of a Canoe. This object belonged to the h chief Porutu te Takataka of the Ngatiawa tribe, Wellington; and was presented to H.R.H Duke of Edinburgh by his son Ihaia Poruru. It was carved by the well-known Wiremu King the chief who began the war (New Zealand) in 1860.

136. **CREASY, R. G. N.,** 27 Clement's Lane, Lombard Street, E.C Model of Sailing Trawler fitted with auxiliary power.

137. **TYZACK, B. C.,** 13 Preston Road, North Shields. (1) Boat Fis Carrier Model. (2) Ships' Navigable Buoy, Life-Boat Model.

138. **TAGG, T. G.,** The Island, Hampton Court. (1) A Niagara Canoe suitable for rowing or paddling, also for fishing and shooting, fitted with patent swivel row locks and movable centre keel. (2) A Gentleman's Pleasure Punt, suitable for rowing, as as a fishing and shooting boat.

139. **LEE & WIGHT,** Boatbuilders, &c., Tweedmouth, Berwick-on-Tweed. (1) A Deep-Sea Fishing Boat, Full Rigged. (2) A Coble Round Stern, as used on the East Coast. (3) An Angling Boat, as used on the Tweed. (4) A Deep-Sea Fishing Boat (5) Angling Boat and Coble.

140. **WEATHERHEAD, JAMES,** Eyemouth, Berwickshire. (1) Model of Fishing Boat "Waverley;" length, 52 ft.; breadth, 17 ft.; height, 8 ft. 8 in.; awarded First Prize at Yarmouth Exhibition. (2) Model of Fishing Boat.

141. **PARK, JOHN,** Fraserburgh, Aberdeenshire. (1) Model Fishing Boat "Eureka:" to show an improved plan of Lug Sail, adapting it for tacking without lowering or dipping yard At pleasure the sail may be set in the usual way. The tack is traversed round the mast by a traveller and horse. There is also in this model a plan of a chain rail stanchions falling forwards; at pleasure, the rail can be raised by the steersman alone at a moment's notice. (2) Model of a Telescopic Mast, fitted to lower about 15 feet, or a third of total height. The plan is worked by a steel rope and winch gear, within the shell of the lower part of the mast.

142. **WALLIS, WHITWORTH,** 4 The Residences, South Kensington Museum, London, S.W. Model of Fishing Smack.

143. **UPHAM, J. W. & A.,** Brixham, Devon. Half Models of Cutter Trawlers and Fishing Ketch.

144. **BISHOP, S.,** Fernbank Road, Redland, Bristol. Model of a "Guernsey" Mackerel Fishing Boat. Scale 1 inch to 1 ft., built by Exhibitor.

145. **FINDLAY, GEORGE,** Whitehills, Banff, N.B. Models of Fishing Boats used on the North East Coast of Scotland.

146. **KEYMER, H. J. C.,** The Fisheries Iron Works, Great Yarmouth. (1) Model of a Boat not less than 45 feet keel. (2) Model of Off-Shore Boat, with or without steam. (3) Model of Steam Herring and other Fishing Boat or Vessel.

147. **BURT, F. A.,** 56, Grosvenor Road, Westminster, S.W. Carved Figure Head of War Canoe.

148. **BARKER, R. E.,** 15 Brooklyn Road, Shepherd's Bush. Safety Boat with Pivoted Mast.

149. **WILSON, PETER,** Offices of the Fisheries, Girvan, Ayrshire. (1) Deep Sea Line or Herring Drift Boat. (2) West Coast Trawl Skiff. (3) Drawings of West Coast Trawl Skiff. (4) Two Drawings of Rig of Deep-Sea Boat with ordinary and Storm Sails.

150. **McMILLAN, ANDREW,** 33 Eton Street, Hessle Road, Hull. Model of Boat for conveying Fish from the Smack to the Steam Cutter. Showing the arrangement for life-saving. Scale 3 in. to the foot.

**THOMSON AND SON.**

FLAGS FOR SHIPS, STEAMERS, YACHTS, BOATS, CASTLES, MANSIONS, TENTS, CRICKET, FOOTBALL, ROWING, & SAILING CLUBS.

*SOLE FLAG MAKERS* TO

**H.M. Navy, also Makers to H.M. Government and Foreign Governments.**

**21, London Street, Mark Lane, E.C.; and 283, Wapping, E.**

51. **TAYLOR, ALEXANDER,** Boatbuilder and Fish Curer, Landhaven, erburgh, N.B. (1) Model of Deep Sea or Herring Boat. (2) Model built on a scale of to the foot, the Lug Sail to work by aft the Mast without hoisting or lowering in the ess of tacking; likewise Permanent Safety Rails round the fore part of the boat, and able Rails round the afterpart. (3) (4) Model on a scale of ½ in. to the foot, with alterations on the Lug Sail; also more safely provided he steersman, and with a Winch for hoisting or lowering the mast.

52. **WALES, H.R.H. THE PRINCESS OF,** Marlborough House, lon, W. Model (Working), representing two Fishing Boats at Sea.

53. **JOHNSON, FRANK C.,** The Lodge, Brixham. Fully rigged el of a 40-ton Brixham Sailing Trawler.

54. **EXETER, THE MOST HONOURABLE THE MARQUIS** Burghley Park, Stamford. Model of a Steam Trawling Yacht.

55. **EARL'S SHIPBUILDING AND ENGINEERING COMNY, Limited,** Hull. Plans and Drawings of Steam Trawler.

56. **CRITTON, HENRY,** Cobholm, Southtown, Yarmouth. Half Model ailing Trawler, and also Model of Lifeboat.

57. **WATSON & FOX,** Shipbuilders, Great Western Docks, Plymouth. Model of lines of Plymouth Trawler from which eight vessels have been built. (2) Model nes of Plymouth Trawler. (3) Half-model of Plymouth or South Coast Trawler, from h eight vessels have been built; length 70·4; breadth, 17·5; depth, 9·4; register age, 47. (4) Half Model of Plymouth Trawler. This vessel is fitted as a Yacht, and es three months in the summer, and trawls the remainder of the year; length, 73·5; dth 17·2; length, L.W.L., 70 2; depth, 10·0; Reg. Ton. 46 tons; Y.R.A. Rule, 74 tons.

58. **GARROOD, CHARLES,** South Lodge, Forest Hill, London, S.E. rawing of Boat, showing apparatus to prevent capsizing.

59. **SUMMERS, ANDREW,** 42 Cairnbulg, Fraserburgh, Aberdeen-. Model, Fishing Scull, half real size with mock baited line, all got up and made by the ibitor.

60. **TARNER, G. EDWARD,** 35 High Street, St. Marylebone, London, (1) Sectional Sketch Model of Ship: illustrating Pamphlet—Suggestions for Increasing Safety of Ships, by the Combination of Hollow-End Compartments with Girder Keel, "Suggestions" attached, accompanied by two small whole models, and lead weights for ing the effect of hollow-end compartments by experiment (exhibited at the Shipwright's pany's Exhibition at Fishmongers' Hall, 1882), a system of construction applicable in a ter or less degree to ships and vessels of all sizes and for all purposes. (2) Section Model hip in glass case. (3) Two small Models and two Lead Weights on stand under glass r.

61. **MOIR, JAMES,** 11 Upper Grove Place, Edinburgh. Three Oil tings and three sectional elevations of the different boats in use on the North-east Coast of land.

62. **WILKINS, FREDERIC,** C.E., 55 Poland Street, London, W. Improved Ships for Fishing, Yachting, Passengers, or War uses, with a gasaline engine submarine observatory. (2) Submarine Vessels, Stations, Diving Bells, &c.: these may in under water for years without inconvenience to the crews.

63. **WATSON, JOHN,** 29 North Portland Street, Glasgow. Portable ns Canoe. With water-tight compartment of 400lbs. displacement. Canoe when open is et long by 30 inches broad, and 14 inches deep. A double paddle 7 feet 3 inches long. e when closed rolls up into a cylinder 3 ft. 3 in. long by 9 in. in diameter, including dle and Seat, and weighs 30 lbs. with everything complete.

64. **KING, J., & CO.,** Boat Builders, Three Colt Street, Limehouse, E. Yacht Dinghy. Copper fastened, planked with Mahogany, Brass Rowlocks and Yoke, nce Lug Sail, Mast, Oars, &c. (2) Smack's Dinghy. Copper fastened, Frame of English planked with English elm, Oars, Mast, Yard, Lug Sail, Rowlocks, &c. (3) Steam Launch

**ANDERSON, ABBOTT, AND ANDERSON,**
MAKERS OF
**Fishermen's Oilskin Clothing**
*OF EVERY DESCRIPTION.*
37, Queen Victoria Street London, E.C.
WORKS: LIMEHOUSE, E.

Punt. Copper fastened, Frame of English oak, planked with English elm and fitted Mahogany internal fittings, Balance Lug and Sliding Keel, Mast, Oars, Gun Metal Rowl and Yoke, &c.

**165. DONALDSON, ROBERT,** 5 Quay, Dumbarton, N.B. (1) Model of Decked Fishing Boat, from light-water draught, Lug Sail which does not requ be dipped, and showing Mainsail and Staysail in one. Length 42 ft. keel, 10 ft. beam. 1 in. to the foot. (2) Model of Open Fishing Boat, complete Length, 26 ft. keel, 6 ft. Scale ½ in. to the foot. (3) Model of Punt, ½ in. to the foot. (4) Model of Cot, ½ in. foot. (5) Model of Punt. (6) Model of Cot used for shooting wild fowl.

**166. CORDING, J. C.,** Piccadilly, London, W. India Rubber Boat.

**167. JOHNSTON, WILLIAM,** Scalloway, Shetland, N.B. Model Fishing Boat with a newly invented form of Lug Sail. Constructed so as to allow the tack without being dipped, and various other advantages. Also photographs to e working of same.

**168. WITHERWICK, J.,** Hull. Canoe.

**169. SMITH, GEORGE & JOHN,** Rock Channel Shipyard, Rye, Su Model of a Well Vessel.

**170. TEASDEL, WILLIAM,** C.E., Harbour Works, Great Yarm Norfolk. (1) Model of a Fishing Smack's Boat, for carrying Fish, made so as to e greatest possible safety to the crew. (2) Drawing, showing Plan of Scotch Fishing constructed so as not to sink, even when full of water.

**170*a*. LUCAS, J. M.,** Tintern Lodge, Kew Gardens. Coracle and p from the river Usk, used in Salmon and Trout fishing, constructed so that the angl carry it on his back to and from the water's edge. This coracle is peculiar to the Usk, identical with the craft used by the Ancient Britons; the skin coverings, however, tha employed by the latter having been superseded by light canvas ones tarred over.

**171. ROBERTS, SAMUEL.** Coracle and Paddle.

**172. BERTRAM, J.,** 241 King's Road, Chelsea, London, S.W. (1) proved Mast to do away with Dipping of Lug. (2) An Improved Rig, which will e crew to work the boat much easier than the old system of the Dipping Lug, the w qualities will be found far superior to the old Rig, and, having a Centre Board, will p the ballast from shifting, part of the floor being left off to show the provision for A Model of Fish Box that will act as Lifebuoy; by connecting such boxes together, a r be formed.

**173. STEVEN, GEORGE,** Boatbuilder and Fisherman, Gardeca Banffshire, N.B. Model of Drift Boat for Herring Fishing, 40-ft. Keel, ½-in. Scale, Cl Built, Full Rigged.

**174. LOYNES, JOHN,** Elm Hill, Norwich. (1) Model of Centre Rowable Sailing Boat, fitted with interchangeable rigs, instantaneous adjustable sw other special fittings for cruises. (2) Model of a Shallow Water Yacht, exhibiting a sible and movable cabin, giving at pleasure extra well room by day and head room by (3) Chart and Photographs, illustrating the Angling and Yachting waters for which the boats have been primarily designed.

**175. KEMP, ROBERT, JUN.,** Mutford Bridge, Lowestoft, Su (1) Model of Freshwater Fishing Boat. (2) Model of Freshwater Fishing Yacht signed to combine with the light draught and handiness required on the Norfolk Bro greatest possible amount of comfort.

**176. JACKSON,** (Agent) **J. T. GRINDROD,** 2, Marine Terrace, Brighton. (1) Concave-Bottomed Vessels. (2) Full-sized Canoe for Cruising and F (3) A Model of a Life Boat to ¾ in. scale. (4) A Model of a Coble or Fishing B ½ in. scale.

**177. WOODCOCK, J. P.,** 23 Abingdon Street, Westminster. Mo Centre-Plate Lugger, with Balanced Lug Mainsail.

**ANDERSON, ABBOTT, AND ANDERSON,**

SOLE MANUFACTURERS OF THE CELEBRATED

**LEVE ANTIPLUVIUM WATERPROOF GARMENTS,**

SUITED FOR ALL CLIMATES

*Specially adapted for Fishing, Shooting, and General Purposes.*

**BUNDOCK, THOMAS A.**, Leigh, near Southend-on-Sea, Essex. 'ishing Boat, with Shrimp Gear, in working order (inch scale), also used for dredging Spratch catching, carrying to London and Billingsgate. Long Lining for Cod, Skate, general Trawling purpose.

**ÆOLUS WATERSPRAY VENTILATING COMPANY**, 235 olborn, W.C. System of Ventilation as applied to the holds of steam trawlers and iers.

**GURR, JOHN**, 5 Egbert Street, St. George's Road, Regent's Park, 1) Model of a Boat with a handier and safer Rig than the Lug Sail. (2) Model of an d Lifeboat. (3) Model of a Safe Skiff for sea or river use, for rowing or sailing. To n as the "O'Gee" Skiff. (4) Samples of a simple and Effective Life Belt that a child e.

**BRADFORD, W. H.**, Great Saughall, near Chester. River Fishing ith Well. Ingress of fresh water by pipes through the bottom of boat into well. of fresh water by occasionally baling or pumping out water, it being re-supplied ingress pipes from the stream below. Adopted, instead of having to moor, for current to pass through the well.

**GULSTON, G. S.**, Marston Lodge, Cheltenham. Model of Off-shore Boat, with improved Rig, and designed to lie on hard ground.

**LINDSAY, W. N.**, Leith, N.B. East Coast Fishing Boat.

**McCUBBIN, JAMES**, Boatbuilder, Port Street, Annan, N.B. Model p Boat used in the Solway Firth.

**EMERY, LEWIS**, Sherringham, Norwich. Norfolk Crab Boat, th fishing gear.

**WARD, ROWLAND, & CO.**, Naturalists, 166 Piccadilly, London. wood Canadian Canoes, Canadian built, showing different sizes and builds, fitted with tal cushions, &c. Built by Gordon and English for Rowland Ward, who first introem into this country. (2) American Portable Canvas Boats.

**RAE, JOHN**, M.D., LL.D., F.R.S., &c., 4 Addison Gardens, South ton, London, W. (1) Model of Eskimo Canoe (kayak), for fishing and hunting; in Greenland. (2) Model of Eskimo Woman's Boat (oomiack) used for fishing and heavy cargo; from Greenland. (3) Model of Fishing and Hunting Canoe, from Coast of British Columbia. (4) Eskimo Fish Spear from Repulse Bay. Made of bone n. One of this size would spear salmon varying from 3 lbs. to 12 or 15 lbs. (5) Model used by Micmac Indians of Eastern Canada, with piece of stone used in old times as prong. (6) Model of Spear or rake used for catching herrings, &c., on the shores of Columbia. (7) A Bundle (3) Ancient Fish Hooks of bone and horn, from McKenzie river.

**FAIRBRASS, HERBERT WYNNE**, Naval Architect, Contractor, veyor, Canterbury. Drawings and Plans of Steam Trawler.

**MACLEOD, B. B.**, 46 Clarges Street, W. Lithograph of Split Lug Rig.

**FLEET**, Dartmouth. Model of a Brixham Trawler.

DIVISION V.—[*Deep Sea Fisheries Gallery.*] *See Plan, p. 8.*

**Ropes and canvas suitable to fishing vessels.**

**BRACEY & SON**, Yarmouth. (1) 60 fathoms 4 in. White Manilla 4 (2) 60 fathoms 3 in. White Manilla 4 Strand. (3) 60 fathoms 2½ in. White Manilla . (4) 100 fathoms 2½ in. Hemp 4 Strand. (5) 60 fathoms 7 in. Trawl Rope. (6) 60 7 in. Manilla Trawl Rope. (7) 60 fathoms 4½ in. Manilla Warp. (8) 60 fathoms 5 in. pe. (9) 50 fathoms 5 in. Bolt Rope. (10) 60 fathoms 4 in. Bolt Rope. (11) 60 3 in. Bolt Rope. (12) 60 fathoms 4 in. Yellow Manilla Rope. (13) 60 fathoms 4 in. Manilla Rope. (14) 65 fathoms 8 in. Hemp Winding Rope. (15) 65 fathoms 8 in. Winding Rope, Shroud Laid. (16) Two 30 fathoms 5½ in. Manilla Bridles.

S. & H. HARRIS'S
BRITISH
POLISHING
PASTE.
**FOR CLEANING ALL METALS AND GLASS.**
Sold by all Dealers throughout the World.

**197. UNITE, JOHN,** 291 Edgware Road, London, W. (1) A Collecti of Ropes suitable for Fishing Vessels. (2) Samples of Canvas for Fishing Vessels.

**198. FROST BROTHERS,** 11 London Street, E.C., and at Shadw Trawl Warps, Ropes, Net Twines, Lines, &c., for fishing purposes.

**199. THOMSON, M. C.,** 67 Great Clyde Street, Glasgow, and 1 Basinghall Street, London, E.C. Works: Ward Mill, Arbroath, N.B. (1) Sailcloth. Bra Crown Hurricane, Crown Royal Extra, Extra all Long Flax, Royal Northern Yacht Ca Double Double Waggon Canvas, No. 1 Strong Hemp Tarpauling, An Imperial Duck. Twines:—No. 1 Fine Flax Seaming, No. 1 Fine Flax Roping.

**200. WARRINGTON WIRE ROPE WORKS, Limited.** Office a Warehouse: 13 Goree Piazzas, Liverpool. Works: Warrington. (1) Show Case of Sam of Ropes adapted for all general purposes. (2) Samples of Wire Ropes adapted for trawl and deep-sea fishing. (3) Sample Coils of Trawl Ropes, Bridles, Head and Foot Ro Fishing Twines of Cotton and Hemp, Cotton Rope and Sundry Fishing Gear.

**201. BELFAST ROPEWORK COMPANY (THE), Limit** Belfast, Ireland. (1) White Manilla Boat Tie. (2) White Manilla Headfast. (3) W Manilla Backrope. (4) White Manilla Lines, assorted sizes. (5) Tarred Manilla Trawl W (6) Tarred Manilla Bridle. (7) Tarred Russian Hemp Stayfall. (8) Tarred Russian H Laniard. (9) Tarred Russian Hemp Boltrope for Sails. (10) Tarred Russian Hemp B rope. (11) White Russian Hemp Hoist Rope. (12) Coir Rope. (13) White Sisal R (14) White Sisal Lines, assorted sizes. (15) Plaited Lines assorted. (16) Package Li &c., assorted, various qualities.

**202. RUTHERFURD BROTHERS,** Ingram Street, Glasgow. (1) Sam Bolts of Sailcloth, Tarpauling and Linen Duck, along with Twine for Sewing same. (2) S cloth, &c., for use of Fishing Smacks and Ships generally.

**203. WEBSTER, FRANCIS, & SONS,** Alma Works, Arbroath, N Flax and Cotton Canvas and Twines.

**204. DIXON, CORBITT, & SPENCER,** Teams Hemp and Wire R Works, Gateshead upon Tyne. (1) Manilla and Russian Hemp Ropes, entirely Mach Spun, and laid upon Self-contained Machines. (2) Galvanized Patent Steel Wire Flex Warps and Running Ropes on Reels and Winches. (3) Patent Stoppers for Wire Towli (4) Cases containing Samples of every description of Fibrous and Wire Ropes and Li Electric Light Leads and Insulated Wires, Patent Testable Lightning Conductors, Cop Iron, and Steel Cords, Engine Packings, &c.

**205. HAWKINS & TIPSON,** 52 and 53 Crutched Friars, London, E and Globe Rope Works, Millwall, E. (1) Two 6-in. Tarred Manilla Trawl Warps. (2) T pairs of 5-in. Tarred Manilla Bridles. (3) Two Coils Coir Rope. (4) Ten Coils Man Rope Running Gear. (5) Six Coils Bolt Rope. (6) Tarred and White Lines, compri Deep Sea Lines, Lead Lines, Halliards, &c. (7) Tarred Hemp Warp. (8) Sample C Wire Rope. (9) Two 3¾-in. Tarred Manilla Herring Warps. (10) Two Coils Tarred He Running Gear.

**206. LONDON STEAM ROPERY COMPANY,** 12 Upper E Smithfield, London, E. Works, Bermondsey Wall, S.E. Branch Store for Eastern Coun Admiralty Wharf, Lowestoft. (1) White Manilla Warps. (2) White Manilla Rope f Running Gear. (3) White Manilla Lines. (4) Tarred Ditto for Trawl Warps. (5) D for Bridles. (6) Ditto for Herring Warps. (7) Bolt Rope for repairing Sails. (8) C Warps and Springs. (9) White Hemp Rope. (10) Tarred Hemp Rope. (11) Staple qu for Running Gear. (12) Fishing Lines of all descriptions. (13) Deep Sea Lead Lin (14) Hand ditto. (15) Signal Halyards. (16) Houseline. (17) Marline. (18) H Lines, &c.

**207. BULLIVANT & CO.,** 72 Mark Lane, London. (1) Patent Flexib Steel: (1) Fishing Ropes. (2) Trawl Warps. (3) Dandy Bridles, &c. (4) Bank Rop (5) Lug Sail Ties. (6) Running Rigging. (7) Hawsers. (8) Cables. (2) Patent Purch Reels for coiling their Hawsers and Trawl Warps. (3) Improved Patent Automatic Nipp

BULLIVANT'S

PATENT FLEXIBLE STEEL WIRE ROPE

Is only one-third the weight of Hemp Rope of similar strength.

*Is* far more durable, easier handled, and Cheaper in first cost than Hemp Rope.

BULLIVANT AND CO., 72 MARK LANE, LONDON.

t Floating Anchor. (5) Galvanised Iron Wire Rigging Rope of various sizes. on Purchase Fall. (7) A 10-ton Purchase Fall. (8) Two Herring Nets, fitted vant's Patent Baulk Ropes. (9) Tyzack's Patent Weldless Anchor.

**UTTON BROTHERS,** Lopen Mills, near Ilminster, Somerset. d Canvas. (2) Undressed ditto. (3) Dressed Twines. (4) Undressed ditto.

**EDGINGTON, BENJAMIN,** 2 Duke Street, London Bridge, E., Tent Makers to H.M. the Queen and H.R.H. the Prince of Wales. (1) A Col· Canvas (Green) prepared by Patent "Willesden" Process, Rot-proof and Water for Sails, Covers, &c. Various qualities. (2) Canvas, Brown Waterproofed Cotton s, Flax and Cotton. (4) Blocks and Pulleys. (5) Sail-making Tools and Needle.

**AMES, E. C.,** British Yacht Fleet, Hythe, Hants. Model Steel rk to take the place of ordinary Mast and Rigging.

**MITCHELL, ANDREW, & CO.,** Sail Cloth Makers, Princes lasgow. Canvas for Sails and Sewing Twines for sewing same.

**RICHARDS & CO.,** Flax Spinners and Manufacturers, Aberdeen. Canvas de Loua, Awning Cloth, Hammocking, White, Dressing, and Duck Canvas. ing Twines. (3) Canvas Hose Pipe, &c.

**PINTSCH'S PATENT LIGHTING COMPANY,** Metropolitan New Broad Street, E.C. Gas Buoy, warranted to burn for three months.

**HAYWARD, RICHARD, & SONS,** West Chinnock and Tail Mill, (1) Various kinds of Canvas and Seaming and Roping Twines; also the raw from which they are made, in various stages, from the growing flax to the finished various implements used in the manipulation. (2) Sail Cloth, Twine, Spun Lines, t stages of preparation.

**HAYWARD, RICHARD, & CO.,** Coker Sailcloth Works, Crew- merset, and at 93 Minories, London, E. (1) Sailcloth (Canvas), as used for Heavy he North Sea Fishing Vessels and elsewhere. (2) Sail Twines.

**SHAW, JOHN,** Soho Street, Sheffield. (1) Improved Patent Flexible re Ropes for Ships' Hawsers and Trawl Warps. (2) Special Steel Ropes for gear, discharging cargo, &c. (3) Steel Cord for Halyards, Log Lines, &c. (4) pe Lightning Conductors.

**DAVIS, J. T.,** Coborn Road, Bow, London, E. Ropes for Fishing unning Gear, Trawl Warps, &c.

**LOVE & SON, JOHN,** Denburn Rope Works, Kirkcaldy, N.B. rps, Manilla and European Cordage, Coir Rope and Hawsers. Fishing Lines as een the Tyne in England and the Moray Firth.

**CORNWALL, COMMITTEE FOR.** For details see No. 32.

**GRIMSBY COAL SALT AND TANNING COMPANY.** ils see No. 14*g*, p. 10.

**EDINBURGH ROPERIE AND SAILCLOTH COMPANY.** see No. 16.

DIVISION VI.—[*East Arcade.*] *See Plan, p.* 26.

**and hand capstans, compasses, barometers, telescopes, amps, fog horns, systems of signalling at night for fishing d vessels, electric lights, luminous paint, and other equipment g vessels, charts for fishermen.**

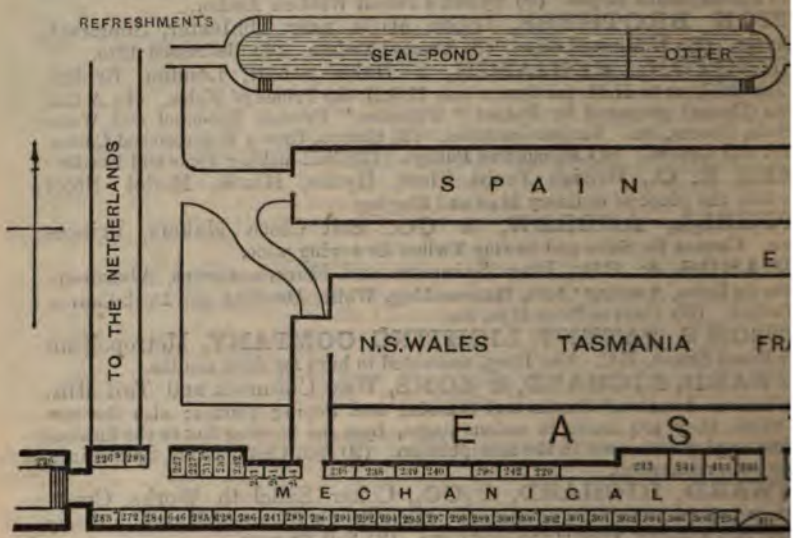
**LAMB, J. M., & CO.,** 119 Finsbury Road, E.C. (1) Exhaust Ship's (2) Triumph and other Rotary Ventilators.

**GAGE, THOMAS,** 53 Tyndall Street, Brixton. Rockets and Distress

**NDERSON, ABBOTT, AND ANDERSON'S**

**BOOTS, ROUSERS, OCKINGS,** **FISHING** **BROGUES, BAGS, COATS.**

***ARE UNEQUALLED.***




**227. HUGHES, HENRY, & SON,** 59 Fenchurch Stree
(1) Samples of Binnacles and Compasses suitable for Fishing Boats. (2
Nautical Instruments, Lamps, Flags, and Signals. (3) Charts and Books.

**227*a*. DENT, E.,** 61 Strand, and Royal Exchange. Chronom
meters, Compasses, &c.

**228. NEGRETTI & ZAMBRA,** Holborn Viaduct, Lon
(1) Standard Barometers as made by Negretti & Zambra for the British Gov
The Meteorological Office Fishing Station Barometer. (3) The Board of T
Barometer. (4) The Fitzroy Marine and Station Barometers. (5) The Royal
boat Station Barometer. (6) Marine Thermometers. (7) Negretti & Zambra's
Sea self-registering Thermometers. (8) Boat Compasses, Ritchie's Patent Liquid
(9) Tide, Wind, and Rain Gauges. (10) Current Meter. (11) Marine Telesco
and Binocular Glasses. (12) Bourdon's Marine Pressure Gauges.

**229. FOX, CAPTAIN H. C.,** 3rd Batt., the Royal Fusili
Thames Yacht Club. Mariners' Compass; by the use of which it is calculated
at sea during Fog can be avoided. The steamer or sailing vessel will sound on
whistle or fog-horn the "Morse" signal, denoting what course she is on—the
course being marked on the different points of the compass, thereby rendering
for captains of vessels to know the "Morse" alphabet.

**230. UNITE, JOHN,** 291 & 293 Edgware Road, London, W.
Clothing and Waterproof Apparel.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***60, 61, 42, BURLINGTON ARCADE, PICCADILLY,***

**PRESENTS—ELEGANT, CHEAP, and USEFUL.**

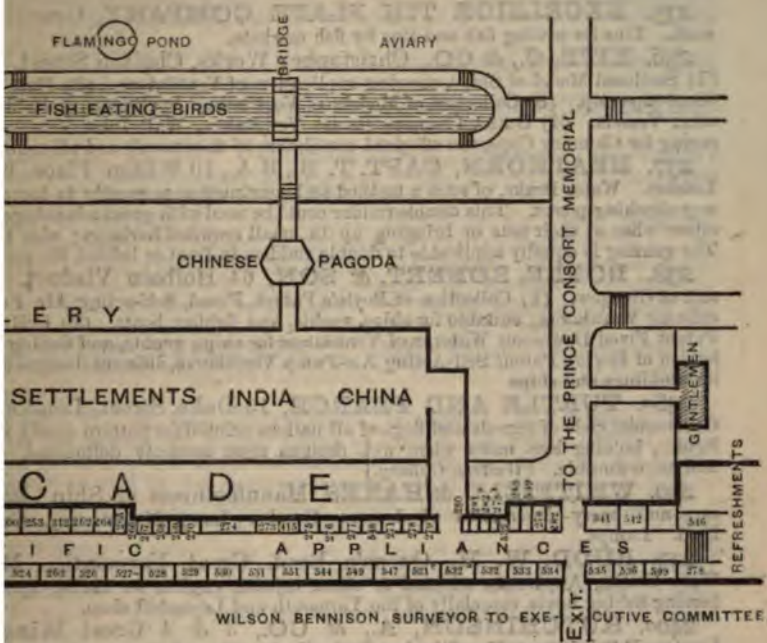
***WORK CASKETS, CARRIAGE PURSE BAGS, RUSSIA ALBUMS, FRAME***

**NOVELTIES IN PLUSH, BRASS, QUAINT LETTER WEIGH**

**BANTAMS, 10s. 6d.**

**OLIVE-WOOD BOAT INKSTAND, 5s. 6d.** GRACEFUL CHINA FIGURES

***ENGLISH CUTLERY, KNIVES, SCISSORS, NEEDLES.***




**N, O. T.,** Fish-Dock Road, Grimsby. (1) Improved Flare and gnal Code. (2) Signal System for Fishing Vessels and Fleets. (3) North ) Fishing Banks. (5) Manuscript dealing with Partnership and Benefit Fishery. (6) On the Best System of Life Insurance for Fishermen and of Gear, Nets, &c.

**PER, T. W., & SON,** 10, Answell Street, Clerkenwell. Time-rmen and Sailors which cannot be damaged by water or overwound.

**EE & HORNE,** 31 Aldermanbury, London. (1) Luminous Patent. (2) Luminous Life-Buoys, Fishing-net Buoys, Mooring Buoys, Numbers for Pilots and Fishing Boats, Compass Cards, Fishing Baits, Danger r Weirs, &c. The Fleuss' Combined Patent Diving and Noxious Gas person using this apparatus breathes his own breath over and over again, h expiration being passed through a filter containing caustic soda, which robs exhalations, and it is revivified with its complement of oxygen under pressure. tus is to be used for diving purposes and also for entering the hold of a ship ere may be dense smoke, or in mines where there may be noxious gases, in eries, sewers, &c.

**ELECTRIC MOTOR SYNDICATE, Limited,** Callow 3 Copthall Buildings, Bank, E.C. Electric Bells, Indicators, and Signals for estic Use.

**DDCOCK, JAMES,** Burns Works, Sheffield. Telescopes, Deep Sea Thermometers, Ships' Compasses, Microscopes.

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atest Waterproof Garments ever made.
EGANT, DURABLE, & CHEAP.
t of Hat, Coat, and Leggings,
only 11 oz.

E LEVE ANTIPLUVIUM.

SOLE MANUFACTURERS.
37, QUEEN VICTORIA STREET, LONDON, E.C.
ANDERSON, ABBOTT, & ANDERSON.

**235. EXCELSIOR TIN PLATE COMPANY,** Gravel Lane, S
wark. Tins for potting fish and tins for fish markets.

**236. KITE, C., & CO.,** Christopher Works, Chalton Street, London,
(1) Sectional Model of Ships, showing application of Ventilators. (2) Full-Size Sh
Stove-pipe Cap. (3) Collection of Models of Ventilating Appliances, suitable for F
other Vessels. (4) Outlet Chimney Breast Ventilators, Wall Inlet Ventilators, and
curing for Chimney Caps, the effectual ventilation of fishermen's and all ordinary dw

**237. HEATHORN, CAPT. T. B.,** R.A., 10 Wilton Place, Knightb
London. Water Brake, of such a method and construction as greatly to increase the
way-checking power. This double rudder could be used with great advantage by fishing
either when at their nets or bringing up in small crowded harbours; also by river
The gearing is equally applicable to double rudders in front or behind the propeller.

**238. BOYLE, ROBERT, & SON,** 64 Holborn Viaduct, Lond
and at Glasgow. (1) Collection of Boyle's Patent, Fixed, Self-acting Air Pump, W
exhaust Ventilators; suitable for ships, yachts, and fishing boats. (2) Collection of
Patent Fixed Down-cast Waterproof Ventilators for ships, yachts, and fishing boats.
lection of Boyle's Patent Self-Acting Air-Pump Ventilators, different designs and sizes,
for buildings and ships.

**238*a*. TURTLE AND PEARCE,** 13 Duke Street, London Brid
Commercial code of signals and flags of all nations printed (or pattern dyed), seamless
lighter, holding less water when wet, designs more correctly delineated, colours
and more durable. [*Western Gallery.*]

**239. WHITFIELD & HAKES,** Manufacturers of Ship, Railway,
car, and every description of Lamps, Humber Lamp Manufactory, Commercial
Hull. Lamps.

**240. RUDD, W. H.,** Queen's Road, Great Yarmouth. Model of
Warp Coiling Apparatus, adapted to steam capstan engine, for saving space and
herring fishing boats, especially of the Yarmouth and Lowestoft class.

**240*a*. HUTCHINSON, A., & CO.,** 3 & 4 Great Winchester S
London, E.C. Patent Non-Slipping Stair Nosing, for yachts, steamers or offices.
and more durable than metal.

**241. HALL, DUNBAR, & CO.,** St. Ninian's Colour Works, Leith
Edinburgh. (1) Anti-fouling Composition for Ships' Bottoms. (2) Collection of
Paints, Varnishes, Lacquers, Tars, Cutch, and similar articles. (3) Models of
coated with Anti-fouling Composition. (4) Specimens of Iron Drums, &c., containing
sition, Paints, &c.

**242. PILLEY, WILLIAM, JUN., & CO.,** Upper Highgate, Birmi
(1) Lights for Fishing Vessels. (2) Fog Horns of various kinds.

**243. PATENT FERRULE COMPANY,** Sheepcote Street, Birm
General Shipping Tackle.

**244. HERON, THOMAS,** Gas-lighting Engineer, Pump Street
London Road, Manchester; also Dublin and London. (1) Heron's Patent Cr
Lanterns from 20 to 2000 candles. (2) Heron's Patent Perfect Gas Lamp. (3)
Patent Duplex Gas-Burners. (4) All Kinds of Gas Lighting Appliances.

**245. BOWMAN, JAMES,** 22 Square, Huntly, Aberdeenshire, N.B.
Port and Starboard Side Lights. (2) Patent Binnacle Lamp for burning heavy
(3) Trigonal Signal Light, for small fishing boats under 20 tons. (4) Lights for
Vessels with ruby globes and no chimey burners, same principle as Anchor Light
Globular Anchor Light made so that if a Globe is broken a new one can be fitted in
one. (6) Improved Masthead, Side, and other Ship Lights. (7) Metallic Buoys,
14-inch for Herring Nets.

**246. LAFARGUE, ALPHONSE,** Palace Chambers, 9 Bridge
Westminster, S.W. (1) New Hydraulic Steering Gear for manœuvring vessels
the saving of life and property at sea, thus preventing collisions and danger


**BOYLE'S SYSTEM OF VENTILAT**
**FOR SHIPS AND BUILDINGS**

is pronounced by the most eminent scientific and practical authorities in the kingdom to be most efficient in existence. At the International Ventilation Competition, London, 1882, it was adjudged the Victor and awarded the Prize £50. It also gained the Gold Medal, London, 1882.

"Since these excellent ventilators have been introduced we have now got perfect models of ventilation."—Dr. B. W. Richardson, F.R.S.

ROBERT BOYLE AND SON, 64 Holborn Viaduct, London, and 113 Rothwell Street, Glasgow.

is apparatus is admirably suited for river and canal navigation, where quick, momentary command of the rudder is required. One man is sufficient in any ntrol the largest ship without the assistance of the crew when they would sefully employed.

**IE, PARKER & CO.,** 13 and 14, Milk-Street, and 24, Gresham Fishermen's Jerseys, Stockings, &c.

**ER & ROBSON,** East Greenwich, London. Signalling and Life-tus.

**ARBOUR, F.,** 150 Wellington Street, Glasgow. (1) Busch's vernors exhibited in action. Largely used by Her Majesty's War Office, Office ons Board, Post Offices, Museum, Lighthouses.

**YER & SONS, J.,** Late Janet Taylor & Co, 104 Minories, Manufacturers. (1) Special Night Glasses. (2) Quadrants, Sextants. (3) Spirit Compasses for Steam Fish Carriers and Smacks. (4) Improved India-sion Compasses for the bridge of small steamers. (5) Mercurial Barometers for s. (6) Aneroid Barometers for Smacks. (7) Signal Reading Telescopes and s. (8) Signal and Side Lamps. (9) Binnacles. (10) Flags, &c.

**GINGTON, BENJAMIN,** 2 Duke Street, London Bridge, (1) Sets of Signal Flags, and a Collection of National Flags. (2) Buntings of flag making.

**RVIE, W., & CO.,** Broomielaw, Glasgow. (1) Fishing Boat , red and green. (2) Anchor Lamps as used in the Navy. (3) Not under (4) Set of Bow and Masthead Lamps, as used in the Navy. (5) Set of Bow Lamps as used in the Merchant Service. (6) Two large Lamps as used for r harbour lights. (7) Large Anchor Lamps. (8) 'Tween Deck Lamps.

**LUS WATER SPRAY COMPANY.** (1) A Working Model, of "Æolus" driving fresh air into cabins and extracting vitiated air. (2) l of Steam Trawler, or Carrier, showing "Æolus" driving fresh air into hold vitiated air. (3) Automatic Exhaust Ventilator. (4) Automatic Exhaust 5) Downcast Ventilator with waterproof shaft admitting air but excluding tto, ditto.

**FFITHS, BERDOE & CO. (THE SANITARY PAINT** od, 34 Leadenhall Street, London, E.C.; 51 South John Street, Liverpool. anitary Paints for Fishing Smacks, &c.

**LFF, S. W.,** 75 and 76 High Street, Southampton. The ode of Signal Flags, in tanned canvas pocket signal bag (including Pilot Jack), istructions on linen for signalling at sea, and pockets for burgee, ensign, and

**ELE, HENRY,** Schoolhill, Macduff, N.B. Complete Set of for a lug-sail herring and fishing boat.

**LKER, WILLIAM, & SON,** 22 Netherkirkgate, Aberdeen. (1) optric Signal Lights, two brass side, one anchor, and one masthead lantern. per Dioptric Signal Lights, two copper side, one masthead, and one anchor ne Pair Copper Side Lamps, Clear Dioptric lense and coloured inside lenses. her Signal Lights for Boats. (5) Torch Lights or Flareups. (6) Various Fog alvanized Steel Buoys for fishing nets, with improved swivel arrangement. Steel Buoys for Deep-sea Fishing Lines. (9) Galvanized Water-Tanks. oom Lamps. (11) Galvanized Water Flasks. (12) Model of Galvanized for Barking Herring and other Nets. (13) Galvanized Herring Shovels, Salt

**AS, JOSEPH, & SON,** Little King Street, Birmingham. ip Lamps, including the Patent "Tom Bowling" Globe Lamp.

**LENNAN & OWEN,** 84 Finsbury Park Road. Patent Side peller.

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DELL'S ANTI-FOULING COMPOSITIONS
FOR FISHING SMACKS.
DELL'S ANTI-FOULING COMPOSITIONS
FOR IRON AND WOODEN VESSELS.
DELL'S WHITE ZINC PAINT, VARNISHES, COLORS,
OILS AND PAINTS.
NDELL, SPENCE, & CO., Limited, HULL and LONDON.

**259. TROTTER, JOHN, & CO.**, 7 Great Winchester Street Build London, E.C. (1) Patent Revolving Apparatus for occulting Coast and Harbour constructed so as to work continuously without attention. (2) Patent Revolving Ap for occulting Coast and Harbour Lights, fitted with oil lamp to work continuously for

**259*a*. ADAMS, W. M.**, 23 Percy Circus, W.C. Cœlometer for illustr Nautical Astronomy. Lent by Marine Department of Board of Trade to inventor hibition.

**260. BLUNDELL, SPENCE & CO., Limited**, 9 Upper Th Street, London; and Hull. (1) Anti-fouling Composition for Fishing Smacks. (2 fouling Composition for Iron Vessels. (3) Paints, White Zinc Paint, Varnishes, Colou Extra Boiled Baltic Linseed Oil for Tarpaulins and Oil Skins. (5) Pure Baltic Lin for Fishing Nets. (6) Paints, all Colours, ready mixed for use, in sealed tins. (7) Co for Binnacles.

**261. BOND, J., & SON**, 106 Narrow Street, Limehouse, Londo Blocks, Oars, Steering Gear, Capstans, &c.

**262. BURWOOD, JAMES, & CO.**, South Denes Road, Great Yarm (1) Samples of Blocks used in fitting out Trawling and Drift Net. (2) Fishing Ve Great Yarmouth.

**263. HASLETT & THOMPSON**, 122 Southampton Row, Lo Ship-raising and life-saving inventions.

**264. DICKENSON, J. E.**, 33 Peter's Lane, Liverpool. Cabinet co ing Collection of Blocks, Deadeyes, Hardware, and fittings suitable for Fishing and Boats, Steam or Sail; also Internal Bindings for Blocks, Patent and Metalline Brushes,

**265. NOBLE, ALEXANDER, late SEAMAN**, 55 Hanover St Fraserburgh, Aberdeenshire. Model Carriage for Drawing Boats up from the Sea, launching them.

**266. ROLLO, JAMES**, Mason, Fraserburgh, N.B. A Model for Dra up and Launching Fishing Boats.

**267. INDESTRUCTIBLE PAINT COMPANY**, 27 Cannon Street Paints for the preservation of Ships, Fishing Smacks, &c. Ready mixed for use for all and for every kind of purpose. Browning's Patent Solution for preserving casts or Fish, Molluscs, Fishing Utensils, &c.

**268. WELLS, WILLIAM**, 50 Commercial Street, Leith, N.B. (1) Ma Glue. (2) Anti-Fouling Composition. (3) Elastic Cement for inside Marine Boilers, venting leakage and pitting. Composition for preventing Nets, Lines, Bladders from

**269. DAY, WILLIAM, & CO.**, Patentees, Manufacturers and tractors, Blackheath, London, S.E. (1) Specimen Jar and Basket Patent Composition (2) Specimen Plates coated with Patent Black Varnish for preservative or 1st outside bottoms of fishing smacks, &c. Ditto, Patent Metallic Composition for 2nd prevent fouling. Ditto, Patent Enamel Paint, Marine Cement, &c.

**270. HUBBUCK, THOMAS, & SON**, 24 Lime Street, London Composition for Ships' and Fishing Vessels' Bottoms, to prevent fouling. (2) Paints, Varnishes.

**271. STAVERS, G.**, The Jerusalem Exchange, Cornhill, Londo (1) Two Half-Models, fitted with fish fin rudders. (2) "Fish Fin Rudders" for steering of ocean steamers when the main rudder becomes disabled; and also for steering power when in the Suez Canal or other narrow waters.

**272. CATOR, R. P., REAR-ADMIRAL**, Langley Farm, Beckenh Kent. Alarm Buoy (Self-acting). For denoting the position of the ship ahead steaming in column in a fog. The buoy is towed astern, the same distance as the ship apart: its progress through the water causes a revolving screw to act on the bell; the ship, keeping the buoy close to her, knows the exact position of her next ahead.


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**BLOCKMAKER AND SHIPSMITH,**

**33, PETER'S LANE, HANOVER STREET, LIVERPOOL.**

**Manufacturer by Special Machinery and Steam Power of Blocks, &c., for every description of Vessel and purpose. Also of Patent Internal Block Bindings, and Metalline Bushed Sheaves.**

N.B.—Special Terms to Shipbuilders and for Exports.

**SAX, JULIUS,** 108 Great Russell Street, Bloomsbury, London, W.C. l Signals for Vessels.

**CAMERON, MAJOR G. A.,** Army and Navy Club, W. Damp- tches, which can be put in water for any period of time without destroying their bility.

**BARRY & CO.,** 70 and 71 Bishopsgate Street, E.C. Lifeboat d chocks, showing how easily and simply any sized boat can be put into the water in a minute, with crew and passengers in the boat.

**BISHOP, E.,** Portland Road, South Norwood. Refrigerators for pre- Fish and Meat: no ice required.

**BECK & CO., Limited,** 130 Great Suffolk Street, Southwark, London. s to be seen in action in the Machinery Division.

**BAPTY, S. S.,** 65 Blackheath Road, Greenwich. (1) Collection of fue's Patent Weather Compass. This instrument is a very ingenious combination of meter and hygrometer, giving a forecast of the approaching weather, based on the ric pressure and the amount of moisture in the air. (2) One Log suitable for use by n. (3) Seamen's Apparel.

**LANCASTER, CHARLES,** 151 New Bond Street, W. Guns, rifles ols.

**NEEDHAM, ARTHUR J.,** 14 The Terrace, Hammersmith. Need- jector and Magazine Gun for the use of crews, especially in the whale fishery.

**BODILL, PARKER & CO.,** Great Hampton Row, Birmigham. ples of Thimbles for Sails, Brass, and Iron. (2) Iron Shackles for rigging. (3) Iron ks. (4) Iron Boat Rowlocks. (5) Lamps for Smacks. (6) Fog-horn Bellows. oden Bulls'-eyes for Rigging. (8) Equipment of Fishing Vessels.

**WALSH, J. W.,** Soho Glass Works, Birmingham. Coloured and Deck

**WALKER, THOMAS, & SON,** 58 Oxford Street, Birmingham. ips' Logs. (2) Sounding Machines. (3) Log and Halyard Lines. (4) Bar Magnets. gnetic Needles. (6) Lenses for Ship Lights.

**GREENWAY, CLIVE, VALE & CO.,** The People's Hall Works, gham. (1) Ship Locks and Brassfoundry. (2) Ship Signal, Saloon, Berth, Engine Deck and other Lamps and Lanterns. (3) Side Lights. (4) Guns, Cannonade, and Carriages, Bells, Belfreys. (5) Portable Rivet Forges, Ship Chandlery of every (6) Cork Fenders. (7) Life Buoys, Belts and Jackets. (8) Signal Balls. (9) Flash Rockets and Blue Lights. (10) Bellows and other Fog Horns. (11) Shipping (12) Whip Gins, &c.

**NUNN, WILLIAM, & CO.,** Neptune Works, 204, 205, & 206, St. 's Street, London, E. (1) Two sets of Signal Lamps. (2) Collection of Barometers and ses. (3) Collection of Jimble and Cabin Lamps. (4) Set of Webb's Patent Deck (5) Sundry Lamps and Fittings for Smacks and Herring Boats. (6) Patterns of Masthooks, &c., for Fishing Boats.

**PARTRIDGE & COOPER,** 192 Fleet Street, E.C. Copying e for daily fish price lists.

**PROUT, S.,** Silver Street, Regent Street, W. Patent Dubbin for g and waterproofing fishermen's boots.

**CHADBURN & SON,** 96 Fenchurch Street, E.C., & 71–73 Lord Liverpool. Ships' Engine and Steering Telegraphs.

**WARNER, JOHN, & SON,** The Crescent Foundry, Cripplegate, (1) A 12-inch Turned and Polished Ship's Bell mounted in bronzed cast-iron dolphin (2) A 12-inch Turned and Polished Ship's Bell, mounted in polished brass scroll (3) A 12-inch Turned and Polished Ship's Bell, with polished brass brackets to hang (4) An 8-inch Turned and Polished Ship's Bell, with polished brass brackets to swing.

W G B

GREENWAY, CLIVE, VALE & CO.,
MANUFACTURERS OF
**SHIP LOCKS and BRASS FOUNDRY,**
*Signal, Saloon, Berth and other Ship Lamps, Shipping Tackle, &c.*
THE PEOPLE'S HALL WORKS,
LOVEDAY STREET,
AND PLUME WORKS, NECHELLS,
**BIRMINGHAM.**
(*See above.*)

(5) A 9-inch Turned and Polished Ship's Bell, in polished brass standard frame. (6) 12-inch Turned and Polished Gong Bell, on polished brass standard. (7) A 2-feet Bell [illegible] Flat Pays Fog Gong. (8) A 2-feet Bell Metal Chinese Fog Gong. (9) A 2-feet, [illegible] Trinity House Buoy Bell.

**285. MASSEY, J. EDWARD,** Original Inventor, 17 Chadwell St[illegible] Clerkenwell, London. E.C. (1) Logs and Sounding Machines (Patent) for use on board [illegible] some of these logs having their registering indicator on Deck. (2) Machines for ascertaining [illegible] rates of currents and streams. (3) Working Models and Parts illustrative of same and [illegible] veying technical information as to the construction and working of such machines.

**286. CHORLTON & DUGDALE,** 19 Blackfriars Street, Manch[illegible] "Excelsior" Spring Single, Double & Hinged Berths. "Excelsior" Hinged Berths [illegible] of Cabin.

**287. WILSON, T., & Co.,** Stowmarket. (1) Protected Alkaline [illegible] position. For removing paint and varnish from decks, cabins, &c., without injury to [illegible] repainting. (2) Protected Alkaline Composition, No. 2. For all cleaning purposes. [illegible] thon. A new and effectual preparation for cleaning glass roofs of smiths' shops, &c. [illegible] mens of work exhibited.

**288. GREGORY, JAMES,** Portland Works, Lincoln. A Contin[illegible] Screw "Coilable Screw Hoist," for raising fishing or any other vessels of whatever [illegible] dimensions. (2) An Obtuse-Angled Riddle, encased in a frame on four legs, forming [illegible] cabin. The riddle when required will be useful for the following purposes: ridding [illegible] from stoves, washing vegetables, and cleansing all descriptions of shell-fish.

**289. HEATH & CO., Limited,** 28 Fenchurch Street, London. [illegible] (1) Patent Composite Arc and "Duplex" Sextants and Octants. Patent "Argus," "Du[illegible] Oriental," and other Binocular Glasses. (2) Fisherman's Binocular Glass. (3) Fisher[illegible] "Life Buoy" Aneroid and other Barometers. (4) Fisherman's Boat Spirit Compass [illegible] other Compasses. (5) Fisherman's and other Pocket Compasses. (6) The "London [illegible] the "Transparent" Course Corrector. Bain and Ainsley's Corrector, and other [illegible] detectors. McKenzie's Patent Protractor and rule, and other Nautical Instruments [illegible] Fisherman's "Luminous Compasses. (8) New Patent "Taffrail" Log.

**290. DOLLOND & CO.,** Saint Paul's Churchyard, London, [illegible] Established 1750. (1) The Fisherman's Aneroid Barometer, as supplied to the [illegible] National Lifeboat Institution. (2) The Marine Aneroid Barometer, as supplied to the [illegible] wrecked Fishermen and Mariners' Benevolent Society. (3) Telescopes as used by [illegible] Whalers, Captains, and others; also those supplied to the Trinity service for use on [illegible] Light Ships and in all Light Houses. (4) Sextants. (5) Artificial Horizons. (6) [illegible] Binoculars. (7) An Electric Ship's Log, by means of which the speed of a ship through [illegible] water is registered on board in any number of places at the same instant. (8) Liquid [illegible] passes for small craft. (9) Deep-Sea Thermometers. (10) Electric Anemometers.

**291. UTLEY, THOMAS,** 79 Cameron Street, off Needham [illegible] Liverpool. (1) Two Deck Ventilators. (2) Hatch Combing Ventilator. (3) [illegible] Hatchway fitted. (4) Port-hole Ventilator. (5) Stoke-hole Ventilator. (6) [illegible] State Room Ventilator.

**292. THOMAS, E. C. G.,** National Club, Whitehall Gardens. [illegible] Motor for Electric Light on Vessel or Buoy. By an accumulator the work of 24 [illegible] stored for use at night. Connection is made and broken automatically at sunset and [illegible] (2) Model of Harbour for fishery purposes, consisting of a floating breakwater [illegible] harbour, as an anchorage at all times of tide and weather; an inner harbour with [illegible] the sea walls so placed as to form a well defined entrance, and constructed in such [illegible] to admit additional wave water, and thus make the outgoing tide completely [illegible] incoming one in its action on the bar at the mouth of any river or creek. This [illegible] by the automatic submarine dredge, permanently sweeps away the bar and prevents [illegible] reforming. (3) Submarine self-acting Dredge for clearing away bar from river [illegible] Every outgoing tide propels the dredge, and carries away the silt or sand. (4) [illegible] self-bury Anchor. Unlike ordinary anchors, as it is intended never to be hoisted [illegible]


**CHARLES LANCASTER,**

INVENTOR OF

**THE NON-FOULING SMOOTH OVAL-BORE FOR ALL KINDS OF RIFLES.**

INVENTOR AND PATENTEE OF

**THE FOUR-BARREL BREECH-LOADING HAMMERLESS GUNS, RIFLES, & PISTOLS.**

**Detailed Price Lists on application.**

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root and become a fixture, for use with light vessels, beacons, floating breakwaters. eenway Buoy, half size. A row of these buoys form the breakwater. These detached s of the breakwater cleave the waves, and turn the cleft portions against each other, ausing them to expend their force innocuously, and creating a safe anchorage behind. buoy creates its own electric light and carries a fog bell. (6) Model of Greenway water as a harbour of refuge on the coast. Purely a shelter harbour for use during or when low tide prevents ingress to a neighbouring port, may be constructed in three s, at small cost, and affording any depth of water the largest vessel can require. If ed every fifty miles along the coast it would almost prevent shipwreck, and save one nd lives a year. (7) Model of Greenway Breakwater as a harbour of refuge on the r Bank, or other fishing resort, where fishing boats might have shelter for a few hours y time without losing days by leaving the banks for the coast and its fatal high tide urs; where might lie permanently a store vessel from which smacks might temporarily and which would form a port of call for the steamers sent out by smack owners ect the fish. (8) Model of Greenway Breakwater as supplementing existing harbour , protecting the existing stone piers, and thus obviating the necessity for frequent repairs Wick (where the sea overturned a massive coping of 800 tons in one block), Plymouth, nd creating an additional outer anchorage. (9) Model of Greenway Breakwater shelter- lighthouse, and giving access to them at all times. Thus preventing the chance of the tion of the men and extinction of the lights as almost occurred recently at three of the mportant lighthouses—Calf, Wolf, and Eddystone. (10) Model of Greenway Breakwater ting a coast threatened by marine encroachment, at far less cost and more permanently a continuous sea-wall often needing repair.

3. **SMITH, W., & SONS**, Managers, Newmill Ironworks, Elgin, N.B. (1) auler and Capstan Combined (Hand Power). (2) For Hauling Nets used on Herring ng Boats and others, setting up the Masts, Sails, &c., with friction appliance for paying ets in rough weather.

4. **PAIN, JAMES**, 1 St. Mary Axe, London, E.C., Works, Mitcham, y. (1) Rockets and Lights, as used by the principal Fishing Fleets for night signalling United Kingdom, &c. (2) Red, Green, and White Meteor Rockets for Signalling. (3) Patent Coloured Lights, various colours. (4) Coloured Lights shooting out a number ars. (5) Pain's Patent Distress Signal. (6) Board of Trade Regulation Rockets. (7) el Cartridges. (8) Various Signals. (9) Rockets for Explosive Charges, as supplied ce. Trinity Corporation and Irish Lights. (10) Blue, Red, and Green Lights. (11) r Rockets as used by National Lifeboat Institution, &c.

5. **PICKWELL, ROBERT**, Civil Engineer, Bowlally Lane, Hull. Self-Registering Ships' Compasses and Stands complete. Keeps an exact record of steered course, and duration of all courses, &c.

6. **LEEMAN, JOSEPH**, Aberdeen. Model of an "Automatic Ships' Releasing Apparatus" (patented) whereby both ends are simultaneously disengaged from lear of the ship's tackles, the instant the boat is water-borne. There are no hooks to gle anything, and no setting up of fore and aft lines is required to secure its automatic n.

7. **SELF-OPENING TIN-BOX COMPANY**, (Griffin's Patents), atherstone Griffin, Manager, 19 Kirby Street, Hatton Garden, London, E.C. A ction of Tin Boxes, Cases, &c., for preserved fish, which can be opened in a moment ut cutting or damage to the boxes or their contents.

8. **ARCHER, THOMAS, JUN.**, Dunston Engine Works, Gateshead-yne. (1) Archer's Patent Self-holding Steering Gear. Self-holding against any force e rudder by means of differential gear, whereby the steersman is relieved from the r of back-lash on the wheel, and whereby the true course of the vessel is maintained. ble for Steamers, Tug Boats, Fishing Boats, or Life-Boats. (2) Also Archer's Patent essors or Stoppers and Winches for holding wire hawsers.

9. **MACDONALD, JOHN H. A.**, 15 Abercromby Place, Edinburgh. hote Course Indicator for Ships (Electric), enabling a ship by sweeps of a reflector, to


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## INDIA-RUBBER & OILSKIN CLOTHING

Works: Limehouse, London, E.

**MANUFACTURERS.**

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indicate what helm she is on to approaching vessels. An automatic electric controlling ensures that the light cannot be swept round, except in accordance with the course steered.

**300. DAVIS, JOSEPH, & CO.,** Fitzroy Works, Kennington Park Road, London, S.E. (1) Royal Polytechnic Barometer, in which is incorporated the Admiral Fitzroy's "Prize Medal" Barometer, simplified and improved. (2) A Collection of dials, various Patterns and Woods. (3) Marine Barometers. (4) Aneroid Barometer, specially made for fishermen. (5) A Collection of Aneroid Barometers. (6) Compasses. (7) Telescopes and Marine Glasses. (8) Salinometers and Specific Gravity Tests. (9) Thermometers and Scientific Instruments.

**300*a*. STEVEN BROTHERS & COMPANY,** 35 Upper Thames Street, London.* (1) Yacht and Cabin Stoves. (2) Ships' Hearths, &c.

**301. PEACOCK & BUCHAN,** Southampton and London. (1) Anti-fouling Composition for Fishing Vessels' Bottoms. (2) Ready Mixed Paint for Sea Stores.

**301*a*. CONSTANTINE, S. J.,** 61 Fleet Street, E.C. (1) Ships' Cooking ranges. (2) Yacht and Cabin stoves and cooking utensils.

**301*b*. CASELLA, L.,** 147 Holborn, E.C. (1) Iron Bottle. (2) Tube (broken). (3) Steel Bar. (4) Glass Disc. (5) Casella Miller Deep Sea Thermometer. Specimens broken, 6 pieces. (7) Casella Miller Deep Sea Thermometer by T. Y. Baker. (8) Piezometer ditto.

**302. FRASER, A. B., & CO.,** 6 New Quay, Liverpool. Patent "Apparatus for Fresh-water Distilling Apparatus, suitable for Troop, Passenger and Cattle Ships, Whaling and Deep Sea Fishing Vessels. Sanctioned and approved by the Board of Trade.

**303. CORNWALL, COMMITTEE FOR.** For details, see No. [illegible] p. 116.

**303*a*. MACKENZIE, CAPT. H. SOMERSET,** R.N., 4 Great St. Helens, E.C. Universal Hand Power Winch. Mackenzie Vivian Patent.

**304. MORRISON, WILLIAM, & SONS,** Engineers, Jane Street, Leith, Scotland. (1) Patent Improved Steam Apparatus for hauling and working the nets of fishing boats. (2) Two Patent Net-hauling Machines for hand use. (3) Two Masthead [illegible] for Wire Rope.

**305. DREW & CADMAN,** 245 and 246 High Holborn, London. Glass Lenses, bulls'-eye cut in prism for ships' lamps and signals, Glasses for Barometers and [illegible] pass Cases, Cut and Polished Deck Lights in metal frames. Fish Aquariums and [illegible] Tanks in metal frames and plate glass. All kinds of Plain, Ornamental and Bevelled [illegible] in metal frames for cabins, saloons, &c. All kinds of Glass Show Cases for preserving display of stuffed fish. Books, Fishing Tackle, &c., specially prepared for hot and cold climates.

**306. LIARDET, JOHN EVELYN,** 14 Fenchurch Street, London, E.C. (1) Four Fluked Hinged Anchor, 12 cwt. (2) Three Fluked Stock Anchor. (3) Automatic Mushroom Hinged Anchor, 10 cwt. (4) Spring and Double-[illegible] Windlass, for all Trawlers, Tugs, and other Ships, to be worked by steam or hand power. (5) Towing Spring with Hook, 60 lbs. (6) Four-Bladed Propellers, 50 lbs. (7) Screw Propellers, 50 lbs. (8) "Rule of the Road of the Sea."—Electric Warning, to ring On when the ship is on Port course, and Two Bells, or a Bell and a Gong for Starboard [illegible] Will Light the Port or Starboard Lights, at the Masthead, and a Blue Stern Light in addition to the Bells, to show the position of the ship at night, to be acted on direct by the rudder, to prevent collisions at sea. (9) Ship's Log. (10) Boat Lowering Gear and [illegible] engaging Gear. (11) Spring Link for taking off the snapping and breaking of Cables, Hawsers, Ropes, &c. (12) Complete Working Model, built according to plan with [illegible] Double Ram Steel-Clad Full-rigged Ship, to act as a Guard Ship for protecting Fishing Boats. Designed 1853. (13) Geometrical Drawings of Iron or Steel Tubular Piers, Harbours of Refuge for all purposes, being a fourth the cost of stone or masonry with [illegible] Spring to attach to tiller to relieve strain on rudder. [*Western Gallery.*]

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**ULSTER HOUSE, CONDUIT STREET, W.**

. **WILSON ENGINEERING COMPANY,** Holborn, London. ves for Yachts and Ships. (2) Fish-Cooking Utensils. [*Machinery in Motion g.*]

. **GILDING & SILVERING COMPANY,** 89 Edgware Road, W. S. Gorer, Manager. (1) Specimens of Fish Knives and Forks. (2) "Mermaid" ar. [*Machinery in Motion Building.*]

. **ELECTRICAL FUZE AND SOUND SIGNAL COMPANY.** psgate Street Within, E.C. (1) Samples of high tension and low tension Electrical r firing sound signals, rockets, torpedoes, submarine mines and blasting charges. (2) al Gun Fuzes. (3) Firing Apparatus for lighthouses and volley-firing. (4) Rockets nd signals adopted by Trinity House.

. **LIARDET, LESLIE,** Consulting Engineer, 14 Fenchurch Street, E.C. Automatic boat-detaching gear, both hooks release simultaneously either with ever rods. Self-acting. [*Western Gallery.*]

. **GRIMSBY COAL SALT AND TANNING COMPANY.** ils, see No. 14*h*, p. 9.

DIVISION VII.—[*West Gallery.*] *See Plan, p. 76.*

**Models of harbours, piers and slips, for fishing purposes.**

**LIARDET, JOHN EVELYN,** 8 Breakspear Road, Wickham Park, y, S.E. (1) Drawings of Harbours of Refuge. (2) Wreck Chart of Great Britain land.

**GREAT EASTERN RAILWAY COMPANY,** A. A. Langley, Engineer, Liverpool Street Station, E.C. Model of Lowestoft Harbour and Fish .

**STUART & CO.,** 8 Thomas Street, Edinburgh, and Church Row, use, London, E. Patent Granolithic Steps for Harbours. More durable than stone, n be made at about half the price. Tensile strain, 355·55 lbs. per square inch. e strain—Granolithic step carried 1 ton 13 cwt., without breaking; Craigleith stone ke with a load of 12¾ cwts.

**ABERDEEN HARBOUR COMMISSIONERS,** per William Harbour Engineer, Aberdeen. (1) Model of Harbour constructed of timber and (2) Four cases, photographic views of Aberdeen Harbour.

**CATHCART, LADY GORDON.** Model of Buchie (Cluny) r.

**LUMSDEN, CAPTAIN ROBERT,** 12 Maiden Street, Peterhead. f Peterhead Harbours and Bays, showing plan for Harbour of Refuge in South Bay.

. **THOMAS, E. C. G.,** care of Messrs. King & Co., 65 Cornhill. Harbour protected by Greenway Breaker.

DIVISION VIII.—[*West end of North Gallery.*] *See Plan, p. 52.*

**hing tackle and netting in different stages of preparation, and inery used for working up the raw material.**

. **PATENT AUTOMATIC KNITTING MACHINE COMPANY,** ford Street, London. Knitting Machine for Manufacturing Ribbed Stockings, Jerseys,

. **MANCHESTER COTTON COMPANY,** 51 Corporation Street, ester. Manchester Lines.

. **LONDON AND LEICESTER HOSIERY COMPANY,** 1, 41, Charterhouse Square, London, E.C., and Winifred Street, Leicester. (1) Fisher-ackets, Guernseys, and Stockings, and the machinery for producing the same. (2)

BUY YOUR WADERS FROM THE MAKERS,

**ANDERSON, ABBOTT, & ANDERSON,**

**India Rubber Manufacturers,**

**37, QUEEN VICTORIA ST., LONDON, E.C.**

Model of apparatus for barking nets by steam.

322. **SCOTT, DAVID,** Kinnaird Head Lighthouse, Fras
tus for tightening backropes of herring nets.

324. **JONES, W.,** 10 Eastbro, Scarborough. (1) Mode
Tanning, Tarring, &c., for fishing nets, warps and gear, with specimens of
subjected to the above method. (2) Samples of Hemps used in mak
twines and ropes, as imported, also dressed and manufactured.

326. **TEGETMEIER, WILLIAM B.,** *Field* Office,
An educational series, showing the various knots and contrivances em
netting and braiding and in the construction and repair of the various n
fresh-water fisheries.

328. **EDGINGTON, BENJAMIN,** London Bridge W
and Clothing.

329. **SAMSON, GERARD, & SON,** Grove Iron
Dorset. Loom for making Fishing Nets.

330. **HELYEAR, THOMAS,** West Street, Bridpo
manufacture of Nets for Mackerel, Pilchard, or Herring fishery.

331. **HARRISON, WILLIAM,** 128 Portland Street,
operation: (1) One "Harrison" Stocking Knitter. 6 inches bed.
"Harrison" Stocking Knitter. 8 inches bed. 110 Needles. (3) One
Knitter. 16 inches bed. 224 Needles. (4) One "Harrison" Triplex
bed. 274 Needles. (5) Two Knitted Fisherman's Suit. (6) Six Knitte
(7) Six Knitted Fisherman's Caps. The knitter of 6 inches bed shows
twice the width of needle bed by an open attachment. The knitter
shews a method of compressing it into a small machine by an adjust
knitter "Triplex" will knit two stockings simultaneously, and also is
fisherman's jersey 40 inches diameter, tubular and seamless. All the "
knit jackets, fisherman's jerseys, pants, caps, and overstockings in any f
produced by the capability of the "Harrison" to cross the needles in a
a double web, and knits fashioned, seamless, or tubular, from half inch t

332. **BARBOUR, WILLIAM, & SONS,** Hilden Fl
Ireland. (1) Hemp and Flax Netting Twines. (2) Linen Threads
Salmon Netting Threads. (4) Sturgeon Twine for Net Making. (5)
Best Irish Flax Threads for Net Making. (7) Seaming and Roping
Twines. (9) Linen Yarns. (10) Hemp Yarns.

of and recommended for simplicity of construction, durability, lightness, and cost. examples, showing small compass in which they can be packed. (4) Jointed poles lesign. (5) Sailcloth. (6) Camping Furniture. (7) Jenner's Lemon Saline, an remedy for sea sickness or scurvy; also other maritime necessaries.

**GRIMSBY COAL SALT AND TANNING COMPANY,** ls, see No. 14*i*, p. 10.

DIVISION IX.—[*Life-boat Shed.*] *See Plan, p.* 38.

## boats, their equipment, and life-saving apparatus of every description.

*a Life Boat Gallery, immediately to the north of, and parallel with, the British Deep Sea Fisheries Gallery.*

**GRAY, J. W., & SON,** 115, Leadenhall Street, E.C.. (1) "Whitby" ay and Night Life-buoy for use on steamers and yachts. (2) Model showing Internal of the Buoy. The "Whitby" Buoy, made in twelve water-tight compartments, has cy capable of supporting four people. When released a wire running through a tube ed, and on its reaching the water ignition takes place. The Buoy is also fitted with istle, and a flask for stimulants.

**DENT, EDWIN,** 6 New Saint Mark Street, Dansome Lane, Hull. l of Lifeboat about 20 inches. (2) Life Belt (model) with an arrangement for crews together in case of wreck.

**YOUNG, LAMBTON, C.E.,** 16 Harcourt Terrace, Redcliffe Square, S.W. A glass case conta ning two models of life-saving surf boats to do duty off coast places for protection of bathers. These 16-ft. boats will, when full of water, support e in safety, and can be managed by one man with ease. The rollers at the stern of ats are to enable one to pull a body on board the boat with the least amount of e, thus saving both time (which is of such vital importance), and avoiding the injury bs and other parts of the body, which often happens by being pulled in over the

**SIMON, JOHN,** Rue Ponderense, St. Martin, Guernsey. Model of or Fishing boat.

**BOYD, WILLIAM, F.R.S.A.,** Peterhead, N.B. Model of the raft ted for saving life on the occurrence of the wreck of the French frigate "Medusa," ars, sail, and steering apparatus adapted to it for the purpose of showing how a raft for the rescue of a shipwrecked crew may be steered. With stand.

**HICKS, JOHN,** 6, Breed's Place, Hastings. Model of a Ship's ble Life Raft.

**ACHESON, JOSEPH,** Ballyane Park, New Ross, Co. Wexford. f Fisherman's Lifeboat. Any and every open boat can thus be easily and cheaply *sinkable;* being bulk-headed and decked, level with thwarts, air-tight, bow and stern. boats thus fitted can be used for saving life from ships in distress, carrying double of persons, even when full of water.

**POCOCK BROS.,** 235 Southwark Bridge Road, S.E. Life-saving be used as a bed on board ship.

**GRIFFITH, REES MORRIS,** Bridlington, East Yorks. Model— s Folding Life-Saving and Transporting Raft, in seven sections so as to take up a the room when not in use, each section is an air chamber, with india-rubber tubing buoyancy. For use on passenger and other ships in case of fire, collision, &c., where h is important, everything required for propelling, &c., folds up with it.

**HUDSON, ROBERT,** Blyth, Northumberland. Model of Life This model is 3 ft. 9 in. long with 10½ inches beam. The boat has seven water-ompartments, composed of three skins:—1st, longitudinal; 2nd, cork, upright; 3rd, al. Improved hollow draught, and air-tight compartments alongside.

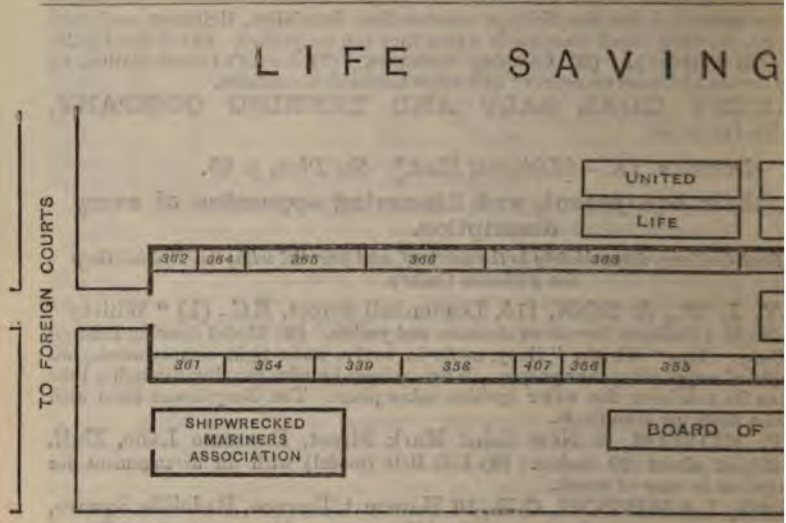
**INDIA-RUBBER DECK BOOTS**

*OF EVERY SIZE AND DESCRIPTION.*

**ANDERSON, ABBOTT, AND ANDERSON,**

INDIA-RUBBER MANUFACTURERS,

*37, QUEEN VICTORIA STREET,* LONDON, E.C.




344. **HEDGCOCK, F. J.,** 34 Great Ormond Street, Quee
London. Model of Life-saving Raft, used as locker and seat; especially ada
mail and emigrant vessels, can be kept provisioned and supplied with lif
compass, sail and rocket-tube, ready for immediate use. When not required a
a useful locker and seat. When required for use the sides are folded out and
fastened across, at once producing a raft of simple adaption and enormous f
Certificate of merit, Life-Saving Appliance Exhibition, Alexandra Palace, 1882.

345. **HUMBLE, WILLIAM, & SON,** Limekiln Shore, No
(1) Cork Life Buoys. (2) Cork Life Jackets. (3) Life-boat, framed with woo
cork, 1¾ inch from keel to gunwale, with air-tight deck and ends, has four tube
her unsinkable. (4) Long Line Floats. (5) Cork Folding Chair. (6) Cork

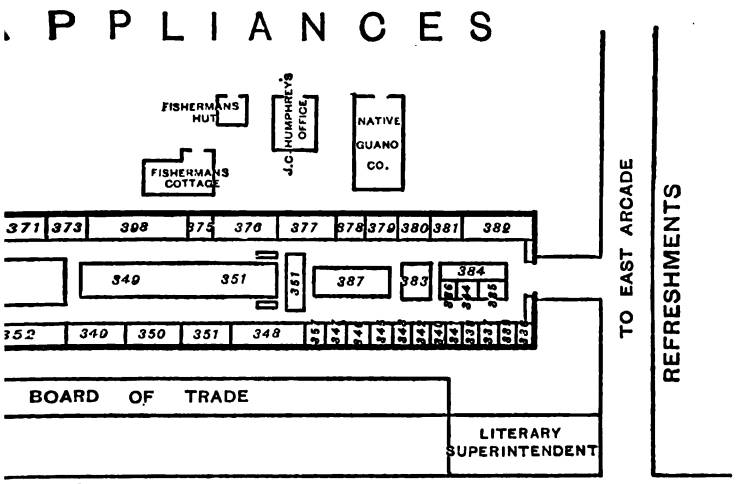
346. **HAMBLIN, NATHANIEL, JUN.,** 57 Bow Lane, Popl
E. (1) Model of a self-righting Life-boat, partly ejecting water from her, fitted
tank and fresh water tank. Air buoyancy easily removed in event of damag
thrown overboard to assist others floating, for the use of ships, yachts, &c., fitted
new disengaging gear. (2) Life Saving Apparatus, frame of boat fitted to fram
instantaneous Boat Disengaging Gear to be seen in action, fitted to any boat for d

347. **TEASDEL, WILLIAM,** C.E., Harbour Works, Great
Norfolk. (1) Model of Lifeboat. (2) Model of Surf Lifeboat. (3) Model of
boat and Carriage. (4) Model of Lifeboat Carriage. (5) Model of Punt for
for getting off Lifeboat. (6) Model of Lifeboat with increased stability and bu

348. **BAHARIE & ADAMSON,** 7 Lawrence Street, and 3
Sunderland. (1) Two models. One ship's Lifeboat built of wood, cork, and
(2) One shore Lifeboat for shore purposes, built of wood, cork and india ru
Exhibitor's patent principle. (3) One Ship's Lifeboat unsinkable and unsta
wood, cork and india rubber.

348*a*. **SHEPHERD, H. C. W.,** Hull House, Raglan Street,
(1) Model of Lifeboat on Carriage. (2) Model of Ship's Lifeboat and
Apparatus.

**ANDERSON, ABBOTT, AND ANDERSON'S**
PATENT TANNED CANVAS RUBBER-LINED FIRE HO
*SUPPLIED TO ALL PARTS OF THE WORLD.*
**Guaranteed Pressure, 300-lbs. to the square inch.**
**37, QUEEN VICTORIA STREE**
LONDON, ENGLAND.
*Prices, Samples, and Opinions of the Press on application.*




**LIE, W., & HAMBLIN, N.,** Boat Builders, New Road, Black-
boat for ship or coast. Self-righting in seaway, unsinkable; ejection of water
l to water line. Oars, mast, sail, &c. Life-belts as gear for above boat. Tanks
of boat to hold 18 gallons of fresh water, and cannisters with water-tight lids
boat, under thwart, to hold 50 biscuits in each. If the boat gets damaged, by
w screws the side buoyance can be taken out and repaired as an ordinary ship's
. Dinghy, Double Head, for one man to go on shore if Launch get on ground.
get run into and sunk, the Dinghy would answer for Lifebuoy; it is able to
rsons in the water. (3) Fresh water Fishing Punt, fitted with buoyance, if
o sink.

**TISH & FOREIGN BOAT-LOWERING APPARATUS**
, 11 West India Dock Road, Limehouse, E. (1) One large model of Lifeboat,
l toy models of Lifeboats. (2) This gear (Carpenter's Patent) provides for
y connecting or disengaging the boat. (3) Improved Boats' Davits, and Screw
Collin).

**AN, ELIZABETH,** Godwin Road, Hastings. Life Boat, Surf
Boat, to pass through waves without losing its equilibrium. (2) Life Raft for
ication. (3) Surf or Life-boat. (4) Model of a Fish Carrier, for preventing
transhipping fish in the North Sea, or other fisheries. (5) Steam Fender,
ip, to lessen damage caused by collision at sea.

**W & DUFF,** Albert Machine Works, Dundee. Four Guns for
m stranded vessels to shore, or from shore to vessels in like position; also for
eboats to wrecked vessels; also from tug-boats to vessels requiring towing; also
ting between two vessels at sea when not possible to approach near each other;
lines to persons in upper flats of burning houses, and for any other purpose
re quick communication by line is desirable.

**NTWORTH, MESSRS.,** 12 Museum Street, London, W.C., Sole
of the "Kredemnon" Life-saving garments and belts, for men, women, and
o of the "Sauve qui peut" combination suits for bathing, boating, wading,
transfer service, and of other Life-saving garments and belts, protected by other

The Best and Cheapest. First Established 1825.
EAVE'S FOOD FOR INFANTS AND INVALIDS.
IN ONE-POUND ONE SHILLING CANISTERS.
LD EVERYWHERE. WHOLESALE OF THE MANUFACTURERS,
R. NEAVE & Co., Fordingbridge, England

Patents; many of the female garments can be made up in any prevailing fashion. ensured while additional weight is scarcely perceptible. Unsinkable clothing for fish For Fishermen's and Sailors' Clothing see No. 527.

353*a*. **BERNEY, GEORGE DUCKETT,** Morton Hall, Nor Sheet of Illustrations of Captain Manby's Life-saving Apparatus.

354. **FORRESTT & SON,** Norway Yard, Limehouse, and Yard, Millwall, London. (1) Full size Coast Life-boat. (2) Life-boat for conveya (3) Patent Life-raft. (4) Model of Steam Tug. (5) Model of Boat, with Impro Gear. (6) Model of Fishing Boat for East and Scotch Coasts. (7) 9 ft. Fishi (8) 10 ft. Fishing Dinghy. (9) 12 ft. Fishing Dinghy, with centre board. (10) Lifeboat for Steam Fish Carriers and other vessels.

355. **SEXTON, JOSEPH,** 3 and 4 Great Winchester Street, Lon (1) Patent Buoyant Deck Seat, with Cushions, full size; which will form a raft wh together. (2) Buoyant Bathing Dress, easily applied to any shape of dress, and at (3) Collection of Life Saving Appliances.

355*a*. **SUGDEN, LIEUT. S. S.,** R.N., Woodford, Essex. Insta Connecting and Disconnecting Shackles.

356. **COPEMAN, E. S.,** Downham Market, Norfolk, and 4 Street, Westminster, S.W. (1) Model of Raft, on a platform two feet above mai with tanks 8 ft. 6 in. by 7 ft. 2 in. Water in tank. (2) Copeman's Patent Seat specimens of deck seats for saving life in case of accident on board passenger vess seats placed together form a raft or life-boat capable of carrying ten or fifteen board, and are supplied with mast, sail, oars, water, and provisions. The buoyan seat is upwards of half a ton, and singly or together they will support fifty or sixty the water, with provisions and means of signalling.

357. **BEECHING BROTHERS,** Ship and Boat Builders, Yarmouth. Model of Lifeboat, with equipments.

358. **ROPER, RICHARD,** 143 Lewisham High Road, New Cr Awarded the First Prize (100 Guineas) at the Naval Exhibition, London, 1882, means of Saving Life at Sea. (1) A Working Model, scale 1 in. to 1 foot, represent ship section of a large ocean-going steamer or troopship, fitted with self-launching rafts, with fluted bottoms, built on the cellular principle. (2) A similar mod different method of launching. This raft is suitable for fish-carrying steamers. the deck-house is fitted with a self-floating raft. (3) A similar model ¾ in. scale to different method of launching, showing how tops of charts, deck-houses, &c., can be self-floating rafts. (4) Raft fitted up for troopship for saving life, landing cargo, &c. Scale ¾ in. to 1 ft. (5) Life raft, fitted with a raised cabin, suitable for ship, showing the masts, sails, &c., complete. (6) Tubular raft, fitted complete, method of constructing them on the tubular principle. Scale ½ in. to 1 ft. (7) passenger steamer 4,060 tons, scale ¼ in. to 1 ft., fitted with three rafts, one in one in front of forecastle, and one as captain's bridge. Capable of saving the lives crowded passenger ships. (8) Model of the "Princess Alice," fitted with Roper's rafts capable of carrying 900 persons. (9) Half-model of "Princess Alice," after part, after the collision with the "Bywell Castle," fitted with Roper's self-float will be sunk in tank showing the action. (10) Models showing the different con the life rafts. (11) Life Raft, showing it fitted complete, with sails, masts, rigging water-tight seats, containing water, provisions, signals, rockets, compass, charts, and sitting accommodation for 450. (12) Midship section of a steam or sailing deck-house fitted with Roper's self-launching life-raft, fitted complete. Scale 1 With semicircular launching ways and telescopic extension. The whole of the above are unsinkable, and will be launched in a tank.

359. **ROSE, R., & CO.,** 72 Leadenhall Street, London. (1) Pa Discharging Apparatus. (2) Patent Deck Seat for supporting 50 people. (3) Pa Coop Seat. (4) Small Deck Seat for Yachts. (5) Sea Messenger, Life Buoy Combined. (6) Life Belt Cushions and Beds combined. (7) Models of Various Li

Stop at **BAKER STREET STATION** for

**MADAME TUSSAUD & SONS**

**EXHIBITION.**

**Admission 1s. Extra Rooms, 6d. Open from 10 till 10.**

liances. (8) Balch's Automatic Life Raft. (9) Hand Rocket Apparatus. (10) Balch's Buoy and Signal. (11) Balch's Day and Night Signals. (12) Balch's Electric Sounding ratus. (13) Fishermen's Life-jacket Jersey. (14) Method of Breaking Force of Sea, to be shown in competition for special prizes. (15) Small Patent Apparatus for dis-ging oil; for use in ships' boats and lifeboats. (16) Ditto, larger size, for sailing vessels. Ditto, for steam ships. (18) Floating Shell, with hose for forcing oil from on board ship. Shell filled with oil and cork. (20) Three Paintings illustrating use of oil on water. Drawings illustrating the communication between Fleets and Lightships.

59*a*. **W. BALCH,** 6 Haddington Terrace, Greenwich. Automatic Life Life Buoy and Signals Apparatus for firing distress signals and collision lights; also ratus for sounding by electricity.

61. **HILL & CLARK,** 6 Westminster Chambers, London, S.W. Life-ng Apparatus consisting of models of life and other boats fitted with methods for lowering disengaging them from ships at sea; also plan as fitted to whaling ships' boats for getting quickly and quietly away after the fish. Working models to be seen in action.

62. **BAKER, J. M. B.,** Hammersmith, London, W. (1) Ocean Courier. Boat Cradle. (3) Fire Subduer.

63. **EMERY, LEWIS,** Sherringham, Norwich. Model of Life-boat, with tank to ballast with water when afloat.

64. **HOLMES, NATHANIEL J.,** 8 Great Winchester Street, London. Life-Saving Equipments. (2) Mechanical Compound Reed Foghorns. (3) Life-Buoy Light. (4) Shipwreck Distress Flare. (5) Collision Light and Boat Launching (6) Torpedo Finders. (7) Fish Decoy Light. (8) "Raba," the Fish Preserver.

5. **WILLIAMS, A. H.,** 1 St. Mary's Road, Peckham, London. Samples ented Pontoon or Air Vessel, which can be packed or stowed away in an incredible space, to be used in rafts for saving life at sea. Also for preventing vessels from ag; also for raising sunken vessels, &c.

6. **KING, J., & CO.,** Boat Builder, Three Colt Street, Limehouse, E. or fastened Life-boat Complete, fitted with yellow metal, air-tight buoyancy, Hill & e's lowering gear as supplied for emigrant ships, with oars, mast, sail, water breakers, s, &c.

8. **TIMMIS, ILLIUS AUGUSTUS,** 17 Great George Street, West-er, S.W. (1) A Coast Life-boat. (2) A ship's boat that is unsinkable and reversible, acts as a life-boat or as a life raft, and that can be stowed at davits in the ordinary or launched from a ship without any davits. It also is the best means for using with apparatus, and is pulled to a stranded or wrecked ship through any sea, and cannot be in or swamped. It also serves for a pontoon raft for landing troops, &c.

9. **ROYAL NATIONAL LIFE BOAT INSTITUTION,** 14 John Adelphi, London. (1) Life-boat (self-righting), full-size, on transporting car-(2) Model of Life-boat (self-righting), on transporting carriage. (3) Model of first sh Life-boat (4) Model of same as modified and now in use. (5) Model of Norfolk oat. (6) Model of Tubular Life-boat. (7) Model of Safety Fishing Boat. (8) Model at-house and Boat. (9) Tank with working models. (10) Large Life Belt. (11) an's Life-Belt. (12) Self-acting Valve. (13) Rowing Crutch. (14) Life Buoy. (15) ope. (16) Loaded Cane and Line. (17) Compass. (18) Verey's Pistol and Car-s. (19) Model drogue. (20) Set of mounted instructions. (21) Wreck Charts, ing of Life-boat House and Working drawings.

1. **EDINBURGH, H.R.H. THE DUKE OF, K.G.,** Clarence House, mes's, London, S.W. Models of Life-boats which were presented for service in the Baltic Black Seas by the English inhabitants of St. Petersburgh upon the occasion of the age of His Royal Highness.

2. **WORKSHOP FOR THE BLIND OF KENT.** (1) Cork Fenders. ish Basket. (3) Life saving Cushions.

**ANDERSON, ABBOTT, & ANDERSON'S**
WATERPROOF
**GUN COVERS, GAME BAGS, CARTRIDGE BAGS,**
ARE THE BEST.
***37, QUEEN VICTORIA ST., LONDON, E.C.***

373. **STEEDMAN & McALISTER,** Cathcart Street, Glasgow. Buoys (1) Cut in two to show solidity of article. (2) To Board of Trade requi uncovered. (3) To Board of Trade requirements finished. (4) Ordinary size. ( pattern. (6) Yacht size. (7) Small yacht size. (8) Lifeboat Jackets to Board of requirements. (9) Life Belts, different patterns, for fishermen and passengers. (1 Mattresses and Pillows. (11) Improved Life-saving Seat with detachable cushion Patent Bed or Cot, and a few small articles of similar nature to above.

374. **WILKINS, WILLIAM,** Queen's Road, Tunbridge Wells. A preserving Atmospheric Helmet and Atmospheric Belt (with safety compartments), to and protect the head from the overwhelming effect of the wind, foam, and waves of sea.

375. **WARD, ALFRED,** Kilburn Baths, Kilburn, London, N.W. S life-saving dresses.

376. **DAVIS & LONDON,** 135 Tottenham Court Road, London. Mermaid Life Belts, one in despatch case for gentlemen, and one in canvas bag for sea

377. **ROGERS, JOHN BANTING,** Richmond House, Holloway London, N. (1) Life-saving Apparatus. Model Cart, Mortars, Projectile Anchor Block Shot to throw Rove Rope or Messenger Line, Signal Gun and Rocket Signals fo Boat-lowering apparatus, Slip catch and hook, and other models appertaining to saving sea and land. Models complete and full size. (2) Some Drawings showing a "m which vessels cannot be injured by torpedoes." Also Drawing of "Shield for Ram to vessels from being injured in times of peace."

378. **GRAY, J., & SON,** 153, Edgware Road, London, W. Sam Life-saving Waistcoats of the same description.

379. **WOOD, JOHN WILLIAM,** 34 Great St. Helens, London, E set of Wood's patent self-adjusting Rivet-hole and Leak stoppers, in seven different illustrating plate. For instantly stopping holes and leaks in ships, buoys, boilers, boats, &c., from either inside or outside.

380. **BALLARDIE, D.,** 41 Robertson Street, Glasgow. Life-S Apparatus.

381. **HAMMOND, R. C.,** 11 Stourcliffe Street, Edgware Road, L Swimming Plates on Colonel Dunlop's Patent.

382. **BIRT, J. & A. W.,** 42 Dock Street, London Docks, Lond (1) Collection of Marine Life-saving Appliances, applicable to all classes of vess Life Belts of various descriptions. (3) Life Buoys of various descriptions, with mode struction. (4) The Collection of Life-saving Appliances which gained the Gold Medal Royal Society of Arts, showing how to utilize articles already on board ship (see Parl Paper) viz.:—(*a*) For Men of War—Hammock and Berth Mattresses. (*b*) For Troop Soldiers' Belts with the Mess Tables forming Rafts (now under consideration of the Adm (*c*) For Merchant Ships—Berth Mattresses, Gunwale Buoys, Cushions and Seats. ( Passenger Steamers—Seats, Cushions, Stools, and Gunwale Buoys. (5) Models for ex tion in Seamanship and the Rocket Apparatus. (6) Articles specially designed for D Craft. (7) Life Belts for Fishermen, to be worn when boarding. (8) The Cabin made buoyant and utilized for life-saving purposes. (9) The Cover Over-all of Ice Room made buoyant and utilized for life-saving purposes. (10) The Cover Over-all castle Hatchway made buoyant and utilized for life-saving purposes.

383. **ATKINS, WILLIAM, & ELIAS PARSONS,** Lime Battersea Rise, London. (1) Boat Lifting Apparatus. (2) Stand for Water Tank. (3) Tank. (4) Two Stands for Wood Models. (5) Model in Glass Case. (6) Steel Model, large. (7) Small Steel Model. (8) Two Pictures, in wood frames exhibiting models.

384. **WAYTHE, WILLIAM E.,** Echline House, Princes Road, Yarmouth. Life-saving Kite, for communication from ship to shore or ship to ship.

LIFE BELTS. **J. & A. W. BIRT,** LIFE BUOYS.

*Manufacturers of Marine Life Saving Apparatus,*

**DOCK STREET, LONDON, E.**

To the Admiralty, Board of Trade, Life-Boat Institution, and the principal Ship Owners and Builders
Life Belts, Life Buoys, Rocket Life-Saving Apparatus, Life-Saving Mattresses, Cork Cushions &c.

Awarded the Gold Medal of the Society of Arts for the best means of saving life at Sea
and the Fifty Guinea prize at the Naval Exhibition at the Agricultural Hall
and Prize Medals at all the principal Exhibitions.

or larger according to the force of wind. To come to shore from a ship on the main
wind parallel with the coast, to drop at command, and to be worked by one line only.
its own light or lantern by night.

**LAMBART, LT.-COL. HON. O. G.**, 10 Cliff Parade, Southend-on-
ife-saving Apparatus. "The Utrinque," principally for collisions or founderings.
stowed, always ready for use, has only to be thrown overboard *anyhow*. Provisioned
al days and provided with sail and oar; can neither founder nor upset, nor its inmates
hed out. Not liable to injury by contact with the wreck. It is amply sufficient for
n.

**. WRIGHT, JAMES**, 15 Jamaica Road, Bermondsey, London, S.E.
dels of improved never-failing self-righting Shore Life-boat and Ship's Life-boat, for
mental testing, if necessary, the Shore Life-boat will self-right in all weathers, with sails
sheets fast. (2) Also specimen model of Shore Life-boat.

**. WOOLFE, F. W., & SON**, 46 Lower Shadwell, and Middle
ell, London, E. (1) Unsinkable Ship's Lifeboat, 25 ft. long by 7 ft. beam, constructed
on board passenger ships; fitted with movable air-tight cases on each side and fore and
carry twenty passengers, independent of her crew. (2) Model of Unsinkable Ship's
at in glass case.

**). METEOROLOGICAL OFFICE.** Collection of Meteorological
ments and arrangements for storm warnings, &c., from various countries.

I. Great Britain and Ireland.—The Meteorological Council, 116, Victoria Street,
Lieut.-Gen. R. Strachey, R.E., F.R.S., Chairman; Robert H. Scott, M.A., F.R.S.,
ary. (1) A Series of Twelve Charts, showing the temperature of the sea surface on the
of the United Kingdom in each month of the year from observations taken by the Coast
Lighthouse officials, &c., &c. (These are exhibited in the Central Hall.) (2) Two
showing the mean temperature of the entire sea surface in the months of February and
t, being the coldest and hottest respectively, compiled from original observations. (3)
ly Weather Chart from North-Western Europe at 8 a.m., and a Forecast issued at 11 a.m.
e will be exhibited in a frame in the Central Hall, and will be changed every day about
) (4) Map showing the existing arrangements for Weather Telegraphy on the coasts of
ritish Islands. (5) A Model of a Storm Warning Station, with Cone hoisted. (6) A
meter such as is supplied on loan for public exhibition to fishing stations; 160 stations
been supplied with barometers by the Meteorological Office, and in addition many
ns have been supplied by the National Lifeboat Institution, or by private munificence.
set of Meteorological Instruments such as is supplied to ships. (*a*) A Marine Barometer,
pattern. (*b*) Box containing a set of Six Thermometers, viz., two for wet and dry bull
ometers, one for sea surface temperature, three spare. (*c*) Box containing a set of four
ometers for ascertaining the specific gravity of the sea. (*d*) A Thermometer Screen with
ometers mounted, as supplied to ship. (*e*) Copy of Log, Rough Book and Instructions.

**0. BRASSEY, LADY**, Normanhurst Court, Battle, Sussex. (1) Model of
ing Ship, the "Ellida." So named by Lady Brassey after one of the most famous Viking
s. The model exhibited, a yacht's gig, represents in the details of her structure, the
"Viking" Ship. It was adapted by the Marquis of Ailsa, and built at the Culzean Yacht
Steam-Launch Works, Maybole, Scotland. The original was discovered in 1880 at
tad, near the town of Sandefjord, west of the mouth of Christiana Fjord, a farm on a
ula in Norway. The great interest attached to it is in consequence of it having been
f the burial war-ships in which noted men, according to tradition, were interred during the
0th, and 11th centuries after Christ. This mode of burial has proved of great importance
chæologists, since on excavating some of the grave-mounds in which it was adopted, ships
that remote period have been brought to light in a more or less perfect state of pre-
tion. The period is the later Iron Age or "Viking" Period. It rarely happens that
-mounds consist of a substance in which wood can be preserved for centuries, but this ship
one other, found in the parish of Tune in 1867 between the Christiana Fjord and the
ish frontier) seems to have been buried in a mound of blue-clay, a species of earth
ally selected for its excellent qualities as a preserver of wood. It was excavated by Mr.
aysen, and now belongs to the collection of antiquities in the University of Christiania.

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**FISHING TROUSERS**
**Are unequalled for Quality, Finish and Wear.**
37, QUEEN VICTORIA ST., LONDON, E.C.

The original is 77 ft. 11 in. in length, as she now stands; a few pieces of the woodwork, w ing in the original, have been supplied after a careful study. These restored parts are di guished by a different colour. The ship is entirely of oak, clinker-built, the boards cont with iron nails, and the seams caulked with oakum, made of cows' hair spun into three-stra cord. The planking is about one inch thick. Both oars and canvas were used to propel Of the former there were sixteen on either side, so that thirty-two men would thus be req to serve the oars only; and doubtless the full complement would not be less than forty li There has been no true deck, only loose boards cut into the frames. The tent cloth is of a fine woollen texture, whilst the cords for fastening are of hemp. The pieces of ships' of which a good many were found, are of bast. The rudder is hung by a rope a little forw the sternpost on the right-hand side, as usual in all vessels of the Viking Period, and after, down indeed to the 14th century, hence "starboard" or steering board, the right side of a ship. The method of fastening and guiding this ancient style of side-rudder wa satisfactorily known previous to the discovery of this Gokstad vessel. In that portion ship first opened was found a piece of timber, evidently the anchor-stock, with tra iron. Also two or three small boats neatly built of oak. Underneath this were the some 20 feet in length, exceedingly interesting through their workmanship. The follo other articles were found:—Trace of a landing stage, fragments of sleeping berth, porti wooden chair and a great variety of kitchen utensils, including a massive copper ke wooden plates and drinking-cups, &c. The grave or burial chamber was built just be the mast, and was 15 feet square. In this room, which has a gable roof, the remains of dead were deposited unburnt, and no doubt on a bed, portions of which were found. It had, however, been there, who had dug into the mound, accounting for the fact that the had disappeared. No implements of war were found, but a series of miscellaneous arti including iron fish-hooks and a turned draughtsman of horn in the grave chamber, as as wearing apparel of gold brocade. The barrow or mound from which it was exca was very large and of the usual circular form. The ship was interred in the middle her keel, decorated with shields hung close together along the rail on both sides of vessel. A few of these shields have been restored and placed in position.—BURTON-WH (2) Model of a Chinese Junk. Length, 3 feet 3 inches. (3) Model of Japanese Boat ivory, with boatmen and other figures, upon stand of black lacquer, with leaves and tional waves in gold. The figures are remarkable for their expressions and attitudes. He 4½ inches; length, 1 foot 10 inches. (4) Model of a Japanese Boat, in bronze. (5) Mod Japanese Pleasure Boat, in ivory, with four beautifully executed figures. Length, 12 (6) Model of Japanese Pleasure Boat, the centre covered with a kind of roof. Within a figures of ladies and gentlemen, with steersman, all exceptionally well modelled and ened with colour. The details are so far carried out as to include even the three sandals of the men left outside the covered part on the deck of the boat. Ivory. 14 inches; width, 4½ inches. (7) Model of Chinese River Pleasure Boat, in ivory. (8 of an Outrigger Canoe from Tahiti, carved in wood. (9) Canoe, made from the hollowed trunk of a tree, from Maitea, South Sea Islands. Length 8 feet. (10) Model of a Canoe of bark. Fuegian. (11) Model of an Outrigger Canoe, from the South Sea Islands. Model of a Raft with Lateen Sail, from Island of Formosa. (13) Model of Chinese War Length 3 feet 4 inches. (14) Paddle Steamboat. Earthenware, with a dark-brown from Chanaklesi, Dardanelles. (15) Model of an Outrigged Surf Boat, Ceylon. (16) Boat, model in wood, painted. Length, 2 feet 9 inches. (17) A Figure of Swan, in From its back spring a mast and sail, and its outstretched wings are freighted with chests and fans, and a variety of goods. The mast is in imitation of bamboo, the sail longitudinally, the divisions diapered in patterns, some being coloured, others gilt. In centre of the sail is let in a detached crystal ball within a medallion of chased Behind are a rudder and tiller, and the bird floats on a conventional sea. Japanese. (18) Two Tortoise-shell Boats. (19) Boat, folding, from "Black Curries." (20) Model Fishing Canoe, with paddles and fishing spear. Fuegian. (21) Model of Canoe. (22) Model of Double Canoe, with triangular sails, the position of the canoes being end to end. South Sea.

**391. TRINITY HOUSE, ELDER BRETHREN OF,** Tower Hill London. Models of Lighthouses.


# ANDERSON, ABBOTT, AND ANDERSON

ARE THE MANUFACTURERS OF THE

**ARMY REGULATION CLOAK,**

**37, Queen Victoria St., London, E.C. Works: Limehouse, E.**

HORSE GUARDS, 10th *March*, 1871.—GENTLEMEN,—The Waterproof Coat made by you has been approved of as a pattern for Coats to be worn in wet weather by all Officers. The Material seems excellent, and is exactly what was recommended by the Committee. Your pattern has been now sealed and deposited at the Horse Guards.—I am, Gentlemen, yours obediently,

ARTHUR HERBERT, A.A.G., Qd.

*N.B.*—A General Order on the subject will be issued in next month's orders.

392. **BOARD OF TRADE,** Whitehall Gardens, London, S.W. (1) Rocket fe-Saving Apparatus. (2) Albert and other Medals given as rewards for gallantry in saving at sea. (3) Wreck Charts, &c., &c. (4) Models used at examinations of candidates for tificates of competency as officers in the Mercantile Marine. (5) Rule of the Road at Sea, verse, by Mr. Thomas Gray, Assistant Secretary, Marine Department, Board of Trade.

393. **ROBBINS, JOHN,** Latimer Place, Latimer Street, South Birmingm. (1) Improved Model Fire and Water Escape. (2) Angler's Companion.

394. **SAMPLE AND WARD,** Blyth. (1) Boat Detaching Gear. (2) del Boat and Tank. (3) Model Boat. (4) Gear on Frame. (5) Skeleton Model of Gear. Samples of Patent Mousing Hook, for all kinds of hooks. (7) Patent Life-saving Boat, for ps' use.

395. **LACEY, RICHARD G.,** 4 Goulden Street, Battersea, Surrey. (1) cket Apparatus Box. (2) Alarm Signal Box, for ships in distress. (3) A complete Rocket d Line Box, for throwing lines to distant fishing boats; also for throwing lines from ships in tress to the shore.

397. **PENHEY, WILLIAM H.,** 4 Sherland Villas, Twickenham. A lection of Penhey's Patent Sea Messenger and Life Buoy. Being an improved means of eying messages, mails, and other valuable property from ships at sea, also for saving life ase of wreck or other disaster.

398. **CRITTEN, HENRY,** Southtown, Yarmouth. Model of Lifeboat, righting principle, scale 1 inch, new improvements to tanks being of copper and 2½ inches per, thwarts being raised that height, fronts of tanks bevelled to about 5 inches each side, ing action of boat to be easier by giving her more water ballast, and causing her to rise ker when submerged by the amount of extra air space thus given at top of tanks.

99. **COLWELL, CHARLES,** Rothsay Villa, Southtown, Great Yarth. (1) Model of a Ship, with apparatus attached to prevent collisions at sea by instantly iplying the rudder power tenfold, and additional gear to destroy the momentum; automatic buffers, &c. (2) Model of a Life Boat for Passenger Ships, with conrat stowage for every necessary and comfort, also an awning, &c. (3) Model of a Boat for Coast Purposes; built in compartments, ten below and ten above the r-line, with a cabin for the rescued; screw propeller, and the means of altering the of vessels under "Lug sail" without dipping or lowering the sail. (4) Model of Boat "Tender," and collapsible hauling apparatus. (5) Model of Collapsible Kleet, for tly liberating entangled ropes when made fast. (6) Model of Apparatus to effect ommunication from ship to ship or shore, by a combination of compressed air and spring r. (7) Model of Non-concussive Apparatus and Automatic Brake for Railways; a comion of Hydrostatic and pneumatic power.

00. **BROMELL, WILLIAM,** 8 Egerton Grove, Hulme, Manchester. ell's Life Saving Apparatus:—(1) Dress: The Trouser-Stockings, Life Belt or Buoy, ed waistcoat and Cork Jackets are indispensable adjuncts, but nothing new. (2) et: As a protection to the head against the ocean the helmet is a novelty, or as a ble diving apparatus it is new, made sufficiently capacious for the head to move about, with windows to look out, it rests well down upon the shoulders, and fastened to a strap the back and chest, or by a lengthened band on which the feet could rest. (3) rator: this affords ease to the swimmer to breathe freely; a small nipple in the mouth flexible tube supported by a float. (4) Signal: the balloon signal invention presents a eature in life-saving appliances; a balloon inflated with gas made in mid ocean, and held e at an elevation of a few hundred feet above the person or a boat will and must enforce tion. (5) Gas-bottle: as a portable instrument, in which gas may be generated, or comed gas may be carried sufficient to inflate a good sized balloon, its introduction leads to doption in all sea-going craft, more particularly in life boats for inflating balloon signals ooking. The air-tight compartments may be utilized for the storage of compressed gas. Non-capsizable Life Boat: this boat is made in its entirety, and is also made in parts: pper portion or raft comprising the floor, sides, and ends; the floor is a grating and its the water, the sides and ends form a series of air-tight compartments; the lower

HALF PRICE D'ALMAINE & CO.'S PIANOS

**D'ALMAINE'S PIANOS.** HALF PRICE. In consequence of a change of partnership, the whole of this splendid stock, perfected with all the improvements of the day, viz., steel frame, overstrung trichord throughout check action, &c., is now offered at half price by this long-standing firm of 100 years' reputation, and in order to effect a speedy sale the easiest terms arranged, with 10 years' warranty. Trichord cottages, from hire, £10 to £12.—Class 0, £14; Class 1, £17; Class 2, £20; Class 3, £23; Class 4, £26; Class 5, £30; Class 6, £35; Class 7, £40. American Organs, best class from £5. Carriage free and all risk taken to any station in England. T. D'ALMAINE & CO., 91, FINSBURY PAVEMENT, MOORGATE, E.C.

portion is simply a water tank made in the form of the lower part of an ordinary boat. are connected by four chains which admit of the lowering of the tank a considerable di below the raft. To meet the exigencies arising from a rough sea, the tank is charge water and lowered by means of the four chains; to regain its normal condition the w expelled from the tank by forcing air into it.

**401. ATTYE, MISS,** Guyseliff, Milberton, Leamington. Cork J made from old wine bottle corks.

**402. JAQUES, R. D.** Agent: A. Inderwick, 27 Bedford Row, L Life Boat.

**403. SNOULTER, W. G.,** 96 High Street, Poplar, E. (1) One Raft, model, self-expanding. (2) One Bulwark Life Raft. (3) Life Buoys. (4) Life

## SHETLAND AND THE ORKNEYS.

**GREEN, JOSEPH,** The Docks, Lerwick, Shetland. Model "Sixern," "Sixareen," or six-oared yawl (Old Norse *Sexæringr*). Scale, one inch to t Timber, Norway fir. Fastened, iron. Length on keel, 20 ft.; length, over-all, 29 ft.; amidships, 8 ft.; depth, at stem-head, 5 ft.; depth, amidships, 3 ft. 3 in.; depth, at ster 4 ft. 9 in.; oars, *ars*, pulled with one thole-pin called a *kabe* (Old Norse *keipr*) and a gr called a *humlaband* (Old Norse, *hömluband*), length of, 16 ft.; mast, total length of, 22 ft. total length of, 18 ft.; hoist of sail, 18 ft. 6 in. Total cost, all found, except nets and lin Till within the last forty years or so, all the larger Shetland boats were imported di Norway in boards ready for putting together. At that time, the boats rarely, if ever, ex 18 ft. on keel, and had a somewhat flatter floored midship section. Even at the pres most, if not all, of the names of the different portions of a *sixern*, of the articles equipment, and of the terms used in her navigation and in connection with fishing, are rate, in the outlying parts of Shetland, of Norse origin.

**LAURENCE, JOHN ROBERT,** Fair Isle, Shetland. Model Fair Isle Skiff.

As this model was not made by a professional boatbuilder, the following details of a typical Fair Is kindly supplied by Mr. John Eunson, boatbuilder, East Shore, Dunrossness, are inserted in the place of w taken from the model itself.

Timber, fir. Fastened, iron. Length, on keel, 15 ft. 6 in.; length, over-all, 22 ft.; extreme, 5 ft. 8 in.; depth, at stem-head, 3 ft. 6 in.; depth, at stern-post, 3 ft. 3 in.; mast, st nearly amidships, total length of, 14 ft. 6 in.; yard, total length of, 11 ft.; hoist of sail, oars or paddles (three pair), pulled, as in *sixern*, with *kabe* and *humlaband*, each oar being in length 10 ft. 2 in. Total cost, all found, except fishing lines, £6 10s. These Fa Skiffs, though apparently mere cockle-shells, are very buoyant, and it is said to be wonderful the amount of sea they will live through. Three men constitute the cre pull a very short chopping stroke, at times, when cutting an eddy or string of tide, nearly forty-five a minute. In the last century, similar boats seem to have been in u over Shetland, but at the present day they are confined to Fair Isle.

**ORKNEY,** The Commissioners of Supply for. Model of a We or North Isles, Yawl. Scale, one inch to the foot. Timber, oak and white Norwegian Fastened, galvanized iron. Length, on keel, 14 ft.; length, over-all, 19 ft. 3 in.; beam, ex 7 ft. 6 in.; depth at stem-head, 4 ft. 7½ in.; depth, at lowest point of gunwale, 3 ft. 6½ in.; at stern-post, 4 ft. 4½ in.; oars (two pair), one pair 14 ft., the other, 12 ft.; masts (two 16 ft.; foremast, stepped from stem, 2 ft. 4 in.; mainmast, stepped from stem, 9 ft.; bo outboard, 5 ft.; sails, jib, lateen foresail, and lateen boom-mainsail; jib, hoist, 13 ft., 6 in.—foresail, yard, 9 ft., hoist, 12 ft., foot, 10 ft.—mainsail, yard, 8 ft. 6 in., hoist, foot, 10 ft., boom, 11 ft.. Cost, equipped for sea, £15. The yawl is said to be very and capable of living through very heavy sea; a fair sailer in smooth water, but not in rough water or chopping seas.

The Norse type of boat in the Orkneys is confined chiefly to the North Isles, where skiffs and between a skiff and a yawl are sometimes smack-rigged. In former days all the large boats used at the herring fishery were similar in type and rig to the North Isles yawl. These, however, are now the "Firthy" boats in common use on the East Coast of Scotland. In the Southern Isles the smaller generally built on similar lines to the ordinary English and Scotch type of small boats, and as a rule

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J. R. NEAVE & Co., Fordingbridge, England.

**TUDOR, JOHN R.**, 5 Magdalen Road, St. Leonard's-on-Sea. Model aroese "Eight-man boat," fully equipped for the *grind* or chase of the *Grindehval* or *Grin-Delphinus deductor* of Scoresby, and the Ca'in', or Bottle-nose Whale of Shetland and the ys. Scale, one inch to the foot. Length, on keel, 16 ft. 6 in.; length, over-all, 28 ft. 6 in.; extreme, 6 ft. 6 in.; depth, at stem-head, 6 ft.; depth, at lowest point of gunwale, depth, at stern-post, 5 ft. 6 in.; foremast, 15 ft. 9 in.; foreyard, 6 ft.; mainmast, 13 ft. 6 in.; ard, 10 ft.; oars (eight in number), pulled double-banked, each 11 ft. 9 in. The foremast stepped either at the fore-thwart or at the second thwart. The former is said to be re usual place, and when thus stepped, the boat, *it is said*, will look pretty nearly in the eye. The whaling implements consist of—1. Two lances (*hvalvaaben*), each 12 in. d 4 in. broad (upon a wooden shaft, 6 ft. long), to which a thin line is attached. 2. Two (*söhnakroge*) and lines for towing the whales when dead. 3. A fishing lead or stone, 3 lbs. in weight, slung on to a long line, and used (1) for anchoring or deadening the way; (2) as a missile for driving the whales ashore in a whale-voe (*hvalvaag*) *i.e.* one gradually sloping bottom of loose sand or mud. The Shetland *Sixern*, the Fair Isle Skiff, rth Isles (Orkney) yawl, and the Färoese boat-model are all exhibited together, in order w the descent of the fishing boats, of the present day, belonging to the islands of the m *haaf*, from the *langskip* of Viking times. Curiously to relate, the *stýri* or rudder of king ships seems to have survived in the Färoes till the present century, as Landt, in *scription of the Feroe Islands*, says of the Färoese boats of his day:—

> of these boats are built with a rudder, they are generally steered by means of the oars, yet some of them dded with what is called *stuiri*, which is an implement like a short oar, with which the master steers the n necessary.

will be noticed that all four models have, in common with the Gokstad Viking Ship, owing characteristics in varying degrees—They are all clincher-built; have stems and alike; a flat, or comparatively flat, midship section; a fine run aft; rake of stem and sts; and considerable sheer of gunwale.

**BARNETT, JAMES**, Kirkwall, Orkney. (1) Hand Line for In- (2) Hand Line for Deep Sea. (3) Small Line for Bays. (4) Long Line for Deep 5) "Murderer." (6) Saith Line. (7) Pollack Line. (8) Pock Net for Sillocks. (9) h Net. (10) Sillock or Cuithe Rods. (11) Cuithe Rod and Hair Line. (12) Har- d Lance for Bottle-nosed Whale. (13) Seal Net. (14) Oyster Dredge. (15) Musssel (16) Oyster Tongs and Glass. (17) Lobster Creel. (18) Lobster Ring. (19) Creel. (20) Model of Fishing Boat, not under 45 ft. keel. (21) Model of Drifter for Fisheries. (22) Two Lobster Pots and half Model of a Boat.

## CHANNEL ISLANDS.

**TARDIFF, J. R.**, St. Martin's, Guernsey. Patent Rowlock.

**KEW, THOMAS JOHN**, Wells-next-the-Sea, Norfolk. The "Cata- Uncapsizable Life Raft.

**HALL, W. H.** Inventions for preventing the capsizing of boats.

**HARLAND, H. S.**, Stanbridge, Staplefield, Crawley. Life Saving us for the protection of bathers and skaters.

**CROFTON, COMMANDER THE HONOURABLE F. G.**, arbour House, Kingstown, Ireland. Skeleton model of boat hung from stand to show disengaging boat's tackles instantaneously at will.

**PICHLER, S. F.**, 162 Great Portland Street, London, W. Machine ospheric Pressure. Atmospheric Turbin, or Siren Life-saving Apparatus is put afloat r in connection with the hose, whereby it is controlled and kept from being lost, a continuous life-buoy, effectually floats the whole length, and constant sound s the arrival or whereabout, produced by the compressed air which constitutes the g force supplied from land, wherefrom it can also be steered and lighted by electricity. rbin or Siren in this case acts threefold:—1st, Constant sound; 2nd, Atmospheric on; 3rd, mechanical force to screw propeller. The hose is effected fivefold:—1st, the

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hose a controller; 2nd, continuous life-buoy; 3rd, conductor for compressed air; 4th mission of sound; 5th, cover to electric connection.

**409. TIPPING, H. G. I., R.N.** Life Boat Buoy, uncapsizable, provisions and water; also signal lights.

DIVISION X.—[*East Arcade.*] *See Plan, p.* 26.

**Appliances and methods for breaking the force of the sea entrance of harbours and elsewhere.**

**409*a*. THOMAS, E. C. G.,** care of Messrs. King & Co. Greenway water, consisting of floating buoys of triangular shape with curved sides, that di waves and turn them upon each other and thus deprive them of momentum, pe of vessels anchoring in the dead water behind them.

*** *In Life Boat Gallery.*

**411. LEEDS, L. W.,** 98 Old Jewry, E.C. Drawing, Method of br the force of the sea.

**412. TEASDEL, WILLIAM,** C.E., Harbour Works, Great Yar Norfolk. Drawing of Wave Screen, or Breakwater, for breaking the force of the sea at of bar harbours or elsewhere.

**413. GILLINGS, JAMES,** 19 Havelock Road, Great Yarmou Collection of Appliances for breaking the force of the Sea, to be carried on board of and can also be used as life buoys.

**413*a*. BOWMAN, JAMES,** 22 Square, Huntly, Aberdeenshire. Apparatus for spreading oil for breaking the force of the sea-waves. May be used entrance to harbours, on board fishing boats and the largest sailing vessels. Exhibit No. 245, in Eastern Arcade.

**413*c*. WILKINS, FREDERIC,** C.E., 55 Poland Street, London, Floating Breakwater, Harbour of Refuge, and Landing Stage. These have the bu ordinary ships, but have no freeboard at the bows, so that wind and waves break ov without injurious effect. Suitable for the Goodwin Sands, or any coast.

DIVISION XI.

**Methods of communication from the shore to lightship fishing fleets by submarine cables; telephones or other of signalling.**

**414. BAPTY, S. S.,** 7 Royal Circus Street, Greenwich. Mode of c cation with Lightships and Fishing Fleets. [*East Arcade.*]

**414*a*. TELEGRAPH CONSTRUCTION AND MAINTENA COMPANY,** 38 Old Broad Street, London. Model of Apparatus for Connecting Li with the Shore. [*West Gallery.*]

DIVISION XII.—[*East Arcade.*] *See Plan, p.* 26.

**Methods of protecting submarine cables from injury by fi operations (illustrated by models and drawings).**

**415. SCHREIBER, CARL G. VON,** St. Margaret's College, L toft. (1) Protection for Submarine Cables from injury by fishing operations, &c. (2) and Drawing of an Improved Trawl-net, capable of allowing Immature Fish and Fo escape therefrom. (3) Improved Trawl-heads, capable of clearing with safety salmon and similar obstacles.

LADIES' WATERPROOFS
In French Tweeds. Very Light and Elegant.
ANDERSON, ABBOTT, AND ANDERSON,
INDIA RUBBER MANUFACTURERS,
37, QUEEN VICTORIA STREET, LONDON, E.C.

## Freshwater Fishing.

rigin of the art of angling is lost in the mist of ages. There is ample testimony to that even fly-fishing with an imitation of the natural fly was practised more than 2000 ago. Ælian mentions the fact, and accurately describes the trout in the river Astreus a natural fly called Hippurus, and, how the natives of Macedonia constructed an ion with a body of purple wool and with "wings of a waxy colour," which they dropped the stream and which was seized by the fish. But the art of angling was far older than s the carvings on ancient Egyptian monuments amply testify. The Chinese and Japanese been anglers for ages. The artificial flies of the Japanese would attract the curious tion of British anglers in the present day. The first author of whom we have any note is country, who described "the art of Fyshynge with an Angle," was Dame Juliana ers, Prioress of Sopwell nunnery in Hertfordshire, who wrote and published the Book of lbans in 1486. The first edition, printed by the schoolmaster printer of St. Albans, did ontain the treatise on angling, but the second, "Enprynted at Westmestre by Wynkyn Vorde in the yere of thyncarnacōn of our lorde mcccclxxxxvi" contained the treatise on g. Angling in those days was by no means so common a practice as it is now, as may thered from the reason given by the worthy prioress for including this pamphlet in the larger publication, as she puts it, "bycause that this presean treatyse sholde not come e handys of eche ydle persone whyche wolde desire it yf it were enprynted allone by and put in a lytyle plaunflett, therefore I have compylyd it in a greter volume of dyverse concernynge to gentyll and noble men to the entent that the forsayd ydle persones he sholde have but lytyle mesure in the sayd dysporte of fysshing sholde not by this e utterly dystroye it." Probably for this reason the number of authors who followed e Juliana for the next 200 years or so were very limited. In 1653 Isaak Walton wrote lelightful pastoral, which even at the present day is devoured with pleasure not only by ers but by all lovers of country life and scenes. For another 200 years or so the ber of works on angling came out but slowly, though far more rapidly than in the previous . In 1811 one of the best known lists of angling works was published by G. W. H. Ellis; umbered 80 works. Since then, however, the increase has been most rapid, and during ast 15 or 20 years work after work has poured out of the press until in the present year 883 we read in the new edition of the Bibliotheca Piscatoria, published by Messrs. wood and Satchell lately, that no less than 3158 editions and reprints of 2148 distinct are given and described in their catalogue. Tackle in the far-off times was of the , a taper reed for a rod, some twisted horsehairs for a line, and a hook more remarkable ower than finish, which is not surprising when we find that amateur hook-making was ally practised in those days. And even in books not much more than 100 years old, minute ions were given as to the manufacture of hooks. But the increase of the literature is omatic of the increase in the practice of angling, and if the noble and gentle Dame Juliana only come out of Sopwell Priory to the not far distant banks of the Lea and see the f people who throng its banks on any and every holiday to indulge in the gentle orte of fysshynge with an angle," she would indeed be filled with amazement. For the of angling is now not only the sport of the select few, but of the many; it is a benefi- ealth-giving pursuit, good both for the body and mind of the toiling thousands or even s who throng the back streets of our larger cities, and who have no other inducement to their unhealthy habitations for the fresh air of the country. From this point of view is a national point) the art of angling is a powerful lever for good if properly worked ercised. Fifty years ago the London angler was derided as the Cockney fisherman, and innumerable were cut upon his skill, his rod and his tackle; all this is changed, the men and the tackle now sent forth from the great Metropolis are alike of the first excel- Yearly, at the annual holiday, mighty fishers—peers, members of Parliament, profes- men, hard worked men of business, rush off to Norway or Canada, the Highlands of nd, Wales, and Ireland, and by the banks of murmuring stream or thundering torrent rate brain, muscle and nerve power, in the absorbing pursuit after trout or salmon, ing after a six weeks' interregnum renewed and invigorated, and prepared to encounter the toil and exigencies of modern life and labours. That all the items required for

the practice of their art should be constantly improved upon and brought to the most exce and handy make and fashion, is a matter of course. Rods, reels and lines, though admi enough to meet all requirements in days gone by, are undoubtedly both better made better suited to modern needs now, if the same amount of care is bestowed on their m facture which was wont to be given to them formerly. That much inferior tackle is turned out, owing to the mania for cheapness, is undoubted. Manufacturers to meet desire set up all sorts of clever time-and labour-saving machinery, and turn out rods by score where they could only turn out units by hand. But the careful inspection and thorough test so requisite in the case of a really good article, cannot be and is not g and though it is quite probable that by accident you may get a fairly good thing cheaply equally so that you may find your purchase dear at any price. If an angler desires which he can trust in, he should go to the best makers and pay the best price for it. and other apparatus for fishing for salmon and other fish in fresh water have been so imp that the only fear is that they may become too perfect for the prosperity of the fish while the improvements in waterproof clothing, boats, and all other fishing requisites better be seen than described. All countries have contributed to send us the best they produce in all these matters, and the choice we now have is truly vast and varied.

FRANCIS FRANCIS,
*Angling Editor of the "Field," and late Naturalist Director of the Brighton Aquarium.*

## FRESHWATER FISHING.

*** *In Central Inland Fisheries Gallery (Promenade), running East and West. See Plan.*

### DIVISION XIII.

**Salmon nets and fixed appliances for catching Salmonidæ in their varieties.**

### DIVISION XIV.

**Salmon rods, reels, lines, artificial flies and baits, gaffs, spears creels, &c.**

### DIVISION XV.

**Trout rods, reels, landing nets, lines, artificial flies, baits, baskets bags, &c.**

### DIVISION XVI.

**Pike, barbel, and other coarse-fish rods, reels and tackle, artificial spinning baits, &c.**

### DIVISION XVII.

**Traps, nets, bucks, wheels, and all kinds of apparatus for catching eels, lampreys, &c.**

The Best and Cheapest. First Established 1825.

**NEAVE'S FOOD** FOR **INFANTS AND INVALIDS.**

IN ONE-POUND ONE SHILLING CANISTERS.

SOLD EVERYWHERE. WHOLESALE OF THE MANUFACTURERS,

**J. R. NEAVE & Co., Fordingbridge, England.**

## Division XVIII.

### Hooks, &c.

6. **DAVIDSON, GEORGE & WILLIAM,** 18 Regent Quay, Aber- Model Salmon Bag Net, Fly Net and River Net.

7. **GEMS & CO.,** 94 East Street, Manchester Square. (1) Anglers' rs. (2) Baskets, "Piscatorial Combination," "Bouyant." (3) Life-saving Chairs. Deck Chairs, &c.

8. **TOUGH, GEORGE,** Salmon Fishings, Portmahomack, Rossshire. on Net.

9. **BERWICK SALMON FISHERIES COMPANY, Limited,** ick on Tweed. Model of Salmon Fishing Coble and Weir Shot Net as used on the River d.

9*a*. **SEVERN FISHERIES BOARD.** Willis Bund, *Hon. Sec.* Model of a Fishing Weir at Preston Boats near Shrewsbury. This is a weir used solely e purpose of fishing. Eels and freshwater fish are what are usually caught at it. (2) nd Plan of same. (3) Model of Fishing Weir at Fitz, Shropshire. (4) Ground plan of (5) Plan showing the fish passes erected by the Severn Commission in the Weirs the Severn, Maisemore (Gloucester), Llanthory (Gloucester), Diglis (Worcester), Bevere Worcester), Holt (Worcestershire).

0. **PARKER, WILLIAM,** Chairman of the Board of Conservators of den Fishery District, Carlton Hill, Penrith. (1) Plan of a Stake Net for Salmon, on a of 50 feet to an inch. (2) Detailed Model of one of the largest traps, on a scale of to an inch. (3) Coracle Net.

1. **FOYLE AND BANN FISHERIES,** Fishery Office, Londonderry, d. (1) Stake Net for capture of Salmon in Lough Foyle, Londonderry. (2) Cruives for re of Salmon at the Salmon Leap, Coleraine, on the River Bann. The property of the the Irish Society of London.

2. **FISHERIES PRESERVATION ASSOCIATION,** per H. A. ch, Secretary, 11 Seymour Street, Portman Square. (1) Models of Salmon Nets. (2) ls of Weirs with fish-passes. (3) Models of Putchers, &c.

3. **McCREADIE, G.,** Fort House, Ayr, N.B. Small Bag Net.

3*a*. **ENGLISH, JOSEPH,** Crumlin, County Antrim, Ireland. Trammel t Net used in Lough Neagh, Ireland, for the capture of pollen or fresh-water herrings. lreds of tons of those fish caught by these nets are annually exported to England.

4. **NOBLE, JAMES,** Wick, N.B. Samples of dyed Seal's Wool for ing salmon, grilse and sea trout flies.

5. **VOKINS, WILLIAM,** 1 Porchester Terrace, Hyde Park, W. Fish- d, winch and bag fitted in glazed Mahogany case. A relic of the late J. M. W. Turner, R.A.

6. **CUMMINS, WILLIAM JOHN,** Bishop Auckland. (1) Salmon assorted sizes and qualities. (2) An assortment of Salmon Reels. (3) The "Canadian" on Lines. (4) An assortment of Flies and Baits. (5) An assortment of Gaffs. (6) on Bags. (7) Salmon Fly Books. (8) Salmon and Trout Hooks.

7. **ALFRED & SON,** 20 Moorgate Street, London, E.C. (1) Salmon of Split Cane, Greenheart, Hickory, &c. (2) Salmon Reels, Alfred's Pattern, &c. (3) on Lines, prepared silk and plaited silk and hair. (4) Salmon Casts, plaited gut, double and extra stout single gut. (5) Salmon flies, special collection. (6) Salmon baits, ial fish, phantoms, Bell's Life spinners, &c. (7) Gaffs, Landing Nets, &c. (8) Trout Reels, Lines, Trout Flies on Hall's eyed-hooks, &c. (9) Bell's Life Spinners and other ial Baits. (10) Folding Landing Rings, &c. (11) Pike, Barbel, and other Rods, &c. Eel Traps. (13) Hooks.

8. **LITTLE, G., & CO.,** 15 Fetter Lane, London, E.C. (1) Salmon (2) Salmon Winches and improved Ebonite protected edge Winches. (3) Lines, Fly s, and Dubbing Books. (4) Flies. (5) Baits. (6) Landing Rings, Gaffs, Nets, &c.

**G. LITTLE AND CO.,**

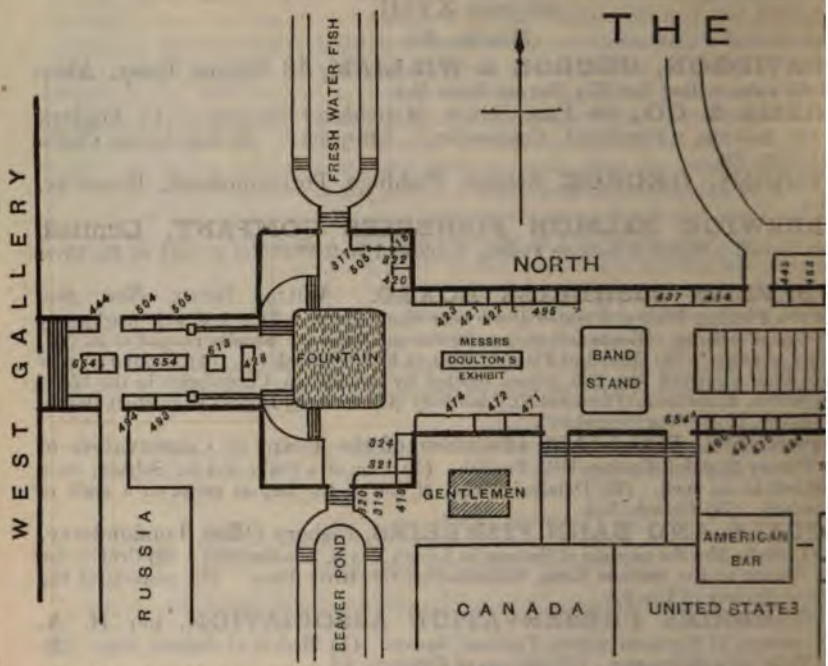
*FISHING ROD AND TACKLE MAKERS.*

**GOLD MEDAL AND DIPLOMA OF HONOUR,**

**Being the Highest Award at the NATIONAL FISHERIES EXHIBITION at Norwich, 1881.**

**15, FETTER LANE, LONDON, E.C.**

E.




(7) Split Cane Rods. (8) Patent Soleskin Phantoms. (9) Trout Rods. (10) S
Rods. (11) Winches, Lines, Flies, Patent Soleskin Phantoms, and Artificial Ba
Unique Fly Book, and Fly Books. (13) New Winch Fittings. (14) Pike Rod
Rods, General Rods, New Winch Fittings, Winches, Lines, Artificial Baits, and all
Tackle and Traces.

429. **FARLOW, CHARLES, & CO.**, 191 Strand, London, W.
Salmon Rods, Reels, Lines, Artificial Flies and Baits, Gaffs, Spears, Creels, &c. (2) Tr
Reels, Landing Nets, Lines, Artificial Flies, Baits, Baskets, Bags, &c. (3) Trolling, S
and Bottom Rods. (4) Pike, Barbel, and other Coarse Fish Rods, Reels and Tackle,
Spinning Baits, &c. (5) Hooks, &c. Swivels and Collapsing Rings, &c.

430. **MILWARD, HENRY, & SONS**, Washford Mills, Redditch
Artificial Trout Flies. (2) Sea, Lake and River Fish Hooks of every descripti
Processes in the manufacture of Fish Hooks in operation.

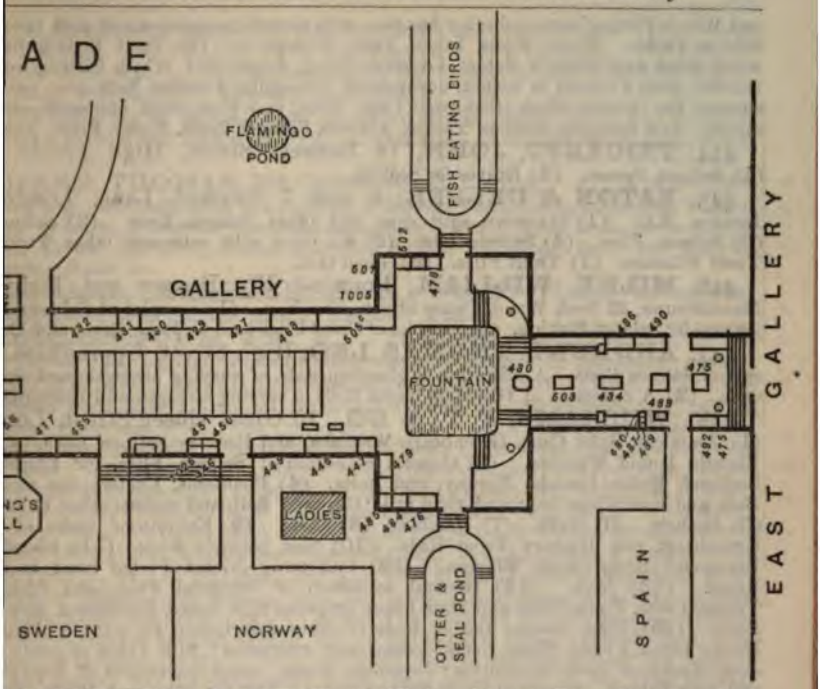
431. **PRICKMAN, E. F.**, 12 North Street, Exeter. (1) Artifici
and Flies. (2) The original "Angel Totnes" Minnow. (3) Artificial Flies m
natural colour feathers and materials. (4) Materials used for making artificial Sa
Trout Flies.

432. **FORREST & SONS**, 35 Square, Kelso, N.B. (1) Salmo
Reels, Lines, Casts, Artificial Flies and Baits, Creels, Fish-bags, Landing Nets, Ga
Trout Rods, Reels, Lines, Casts, Artificial Flies and Baits, Baskets and Bags.

433. **WRIGHT, JAMES**, Sprouston, near Kelso, Roxburghshire, S
(1) Salmon Flies. (2) Salmon Casting Lines. (3) Sea Trout Flies. (4) Loch &
River Trout Flies. (6) Trout Casting Lines.

434. **SMITH, OGDEN**, 4 Stanley Terrace, St. John's Hill, C
Junction. Collection of Salmon, Trout, and other Rods, Artificial Flies, Baits, &c.

**W. BARTLEET AND SONS,**
REDDITCH.
TESTED FISH HOOKS & FISHING TACKLE
See Exhibit Case (*not for competition*) removed from
FRANK BUCKLAND'S FISHERY MUSEUM.
(See Advertisement page xii.) 11 GOLD AND PRIZE MEDALS




**AMSBOTTOM, ROBERT,** 81 Market Street, Manchester. Gut aterial and various forms of manufacture.

**IGLEY, WILLIAM H.,** St. George's Road, Cheltenham. The loucestershire Spinner, and Artificial Bait for Salmon, Trout and Pike.

**ERNEY, GEORGE DUCKETT,** Morton Hall, Norwich. Net and Salmon Gaff. (2) Trout Landing Net. (3) Model of Improved Eel part of its handle cut off. (4) Model of Improved Eel Spear, without its handle.

**OWLES, S. T.,** King's Mill Road, Milton, Sittingbourne. Eel e and double.

**DLEY, W. WELLS,** Holmewood, Kenilworth. Casting and Back. mon and grilse.

**OBERTS, SAMUEL,** Fishing Tackle Maker, Llangollen, N. ection of Salmon and Trout Flies for River Dee (Chester).

**OSTER, D. & W. H.,** Ashbourne, Derbyshire. Trout Fly Rods; w and protected articles); also Fly Lines, Trout and Grayling Flies, Lake ditto, oks (new designs); also special ties in Gut Casts, Sea Trout Rods, &c.; "The gler," &c.

**OPPIN, PERCY,** Glan-yr-Afon, Strawberry Hill. A few mon Flies made by Exhibitor, chiefly suitable for the Welsh Rivers.

**EARNS, JIM,** Upper Mill Street, Ballina, Co. Mayo, Ireland. on and Trout Flies, suitable for Irish, Scotch and English waters.

**ARDY BROTHERS,** Feukle Street, Alnwick, Northumberland. Rods in built cane and wood, fitted with Hardy's Patent Lockfast Spiral Joint,

**DERSON, ABBOTT, AND ANDERSON,**
**37, QUEEN VICTORIA STREET, LONDON, ENGLAND:**
*Largest Manufacturers in the World of the*
**EST OILSKIN CLOTHING.**
***Prize Medals from* all International Exhibitions.**

and Winch Fitting, cork and other handles, with new rings which cannot wear the sil Salmon Tackle. Books, Reels, Lines, Flies, Tackle, &c. (2) Trout Rods in buil wood, fitted with Hardy's Patent Lockfast Spiral Joints, and Winch Fitting, cock handles, from 8 ounces in weight, new pattern Triangular Landing Nets, new patter contain the Tackle Hook, Sandwich Case, Reel, and Fish, with knapsack arran straps; New Spinning Minnow Tackle, Alnwick Spinner Reels, Books, Flies, Tackl

444. **TRICKETT, JOHN,** 16 Bennett Street, High Fields, S (1) Salmon Spears. (2) Knives for Scaling.

445. **EATON & DELLER,** 6 and 7 Crooked Lane, London London, E.C. (1) Six-piece split cane and other Salmon Rods. (2) Salmon (3) Salmon Flies. (4) Salmon Gut. (5) Six-piece split cane and other Trout Trout Winches. (7) Trout Flies. (8) Trout Gut.

446. **MILNE, WILLIAM,** Practical Fly Dresser and Fishin Manufacturer, 32 Back Wynd, Union Street, Aberdeen. (1) Samples of Salmon Fl general for Salmon Fishing. (2) Samples of Trout Flies used for Lake, River and Bro

447. **ANDREWS, THOMAS LEO,** High Street, Uppingham. case of Salmon Rods. A collection of glued-up rods, of varying strength and desc cane. (2) A collection of Glued-up Trout Rods of varying strength and descriptio

448. **WILLIAMS, F. T., & CO.,** 10 Great Queen Street, Lond (1) American Split Cane, Greenheart, Washaba, and Hickory Salmon Rods. (2) Ebonite bound Winches. (3) General collection of Salmon Flies, for Englan Scotland, Wales, Canada, Norway, and India. (4) Phantoms, Exeters, the new Bait, and Exhibitors' improved rigid tail "Clipper" Bait, and various other Baits f (5) Baskets. (6) Gaffs. (7) Handles. (8) Casts. (9) Exhibitors' make of S Greenheart, and Hickory Trout Rods. (10) New portable Rods. (11) Ebonite, Brass, and Brass Check Winches. (12) Collapsing Nickel Plated Steel and Rings. (13) Nets. (14) General collection of Artificial Flies and Spinni Traces, Casts, Plaited Silk and Hair Lines, prepared Silk Lines, Exhibitors' new p Book. (15) Pike, Roach, Barbel Rods of every description, for punt or bank; Hooks, Lines, Floats, Shots, Reels, dressed and undressed; Silk Lines of every d Jack Tackle of every description; Japanned Boxes; every description of Tackle and jack fishing. Improved Rigid Tail "Clipper" Bait for Pike and Perch, Dar and various other Baits. (16) Wicker and Wire Eel Traps. (17) Gudgeon an Cast Nets. (18) New pattern Crystal Roach Hooks, Nickel Plated, Bright and various other pattern Hooks; also double and treble Hooks of various descriptions.

449. **BERNARD, J., & SON,** 5, Church Place, Piccadilly, Lond (1) Salmon Rods, Reels, Lines, Artificial Flies, Baits, Gaffs. (2) Trout Rods, Reels Nets, Lines, Artificial Flies, Baits, &c. (3) Pike, Barbel, and other coarse Fish Ro Tackles, Baits, &c.

450. **ROYSTON, ROBERT RICHARD,** 10 King Street, Ca Sample of Waterproofing, "with line that has been in use 3 years," and to be sh small flat glass case.

451. **FIELD, BASIL,** 36 Lincoln's Inn Fields, London. (1) Te handled Gaff Hook, with a Guard, folding up automatically when handle is clos re-adjusting itself when handle is closed. (2) Bait Can, with Bellows in Handle, f water. (3) Fly Rod, with novel appliance for fastening the splices, and splice prot or covers.

452. **OGDEN & SCOTFORD,** 7 Portland Terrace, Pittville, Chel Fishing Rods and Artificial Flies.

453. **ROGAN, MICHAEL,** Ballyshannon, Co. Donegal. (1) Sal and Salmon Flies. (2) Trout Rod, Double-handed Lake Trout Rod, and Trout Flies.

454. **McMULLEN, WALTER JAS.,** 1 Ilkeston Villas, Ash Grove, East Dulwich, London. (1) Combined Check and Plain Multiplier Wi Combined Check and Plain Winch. (3) Improved Hook Swivel.

455. **ANDERSON, R., AND SON,** Dunkeld, and 56, Princes (1) "Dunkeld" Salmon and Trout Greenheart Rods. (2) Simplex Rod Joints. (3)

J. BERNARD & SON,
5 CHURCH PLACE, PICCADILLY, S.W.
MANUFACTURERS OF
FIRST QUALITY FISHING RODS & TACKLE,
SUITABLE FOR ALL PARTS OF THE WORLD.
PRIZE MEDAL, 1862.

Excelsior Hollow Spindle Reel. (4) Salmon, Grilse, and Trout Lines. (5) Patent kfast Reel Fittings. (6) Paragon Fly-Books, fitted on a new principle. (7) Salmon, ch Loch, and River Flies. (8) Mounted Casts for Lochleven and Highland Lochs. Athole Fishing Basket. (10) Waverley Landing Net.

56. **CARTER, A., & SONS,** 137 St. John Street Road, E.C. (1) Salmon Trout Fishing Rods, Flies, Tackle, &c. (2) A Collection of other Fishing Rods, Flies, Tackle.

58. **ALDRED, THOMAS,** 258 Oxford Street, London. (1) Three-piece d up Triangular Cane, and other descriptions of Salmon Rods, Reels, Lines, and Tackle. Three-piece glued up Triangular cane, and other descriptions of Trout Rods, Reels, Lines, Tackle for Trout. (3) Pike, Barbel, and other Coarse Fish-Rods, Reels and Tackle, ificial Spinning Baits, &c.

59. **PRICHARD, ERASMUS B. P.,** Noyadd House, Llangorse, gerth. Old Salmon Lines formerly used on the River Wye.

60. **BRUNTON, JOHN,** M.A., M.D., 21 Euston Road, London, N.W. Improved Hooks. (2) Bayonet-pointed Hooks, especially adapted for penetrating easily.

63. **SLATER, D.,** 9 and 10 Portland Street, Newark-on-Trent. (1) Col- on of Salmon Rods, Lines, Artificial Flies, and Gut Casts. (2) Collection of Salmon s in Ebonite, Brass and Wood. (3) Collection of Trout Rods. (4) Collection of Trout s in Ebonite, Brass, and Wood. (5) Collection of Trout Lines, single and double taper. Landing Nets. (7) Collection of Artificial Flies. (8) Collection of Trout Rods, Lines, ficial Flies, and Gut Casts. (9) Collection of Artificial Baits. (10) Collection of Pike, el, and other Coarse Fish Rods; also Nottingham style. (11) Collection of Wood Reels, e Pin Reels, with and without check action. (12) Collection of Bottom Tackle, Floats, Lines. (13) Collection of Nottingham Floats and Lines. (14) Collection of general Rods.

4. **WATSON, W., & SONS,** 308 and 313 High Holborn, London, W.C. Collection of Spliced Cane Salmon Rods, and other Salmon Rods of ordinary pattern uperior manufacture and finish. (2) A Collection of Artificial Flies for Salmon Fishing. Collection of various pattern Salmon Reels. (4) Salmon Lines, Gaff Hooks, Creels. Collection of spliced Cane Trout Rods, and Trout Rods of ordinary pattern, but superior facture and finish. (6) A Collection of Reels, Lines, Flies, Bait, &c., for Trout fishing. Collection of Spinning and Trolling Rods, Spinning Bait, Reels, and Tackle. (8) A ction of Hooks for Fishing, comprising all the sizes and patterns in ordinary use.

6. **PATRICK, STEPHEN MELTON,** 15 and 16 Bar Street, Scar- gh. (1) Salmon Rods, Reels, Lines, Artificial Flies, Baits, Gaffs, Spears, Creels. (2) Rods, Reels, Landing Nets, Lines, Artificial Flies, Baits, Baskets, Bags, and special h Fittings.

7. **HOLROYD, E. A.,** 59 Gracechurch Street, London. (1) Salmon including a rod made expressly for use in India and the Colonies, adapted to Salmon, en, and general fishing. Salmon Reels, Lines, Artificial Flies, Baits, &c. (2) Trout Reels, Landing Nets, Lines, Flies, &c. (3) In this division is shown the new patent fitting for fly and spinning rods. (4) Coarse Fish Rods, Reels, and Tackle.

8. **McCARTHY, THOMAS,** William Street, Cashel, co. Tipperary, d. (1) General Collection of Salmon Flies. (2) General Collection of Trout Flies.

9. **HOBAN, WILLIAM,** Callan, Ireland. Case of Salmon and Trout

0. **GEHRLING & SON,** 32 Pembroke Street, Caledonian Road, on, N. (1) Fishing Steelyards or Sportsman's Scales of every description, marked to ounces, or from 1 lb. to 50 lbs., manufactured in brass, with index faces, and nickel- d throughout, preventing rust and inaccuracy. (2) Specimens of Fly Vices for Fly- ing.

1. **MALLOCH, P. D.,** 209 High Street, Perth. (1) Collection of on Rods, Reels, Lines, Gaffs, Artificial Flies and Baits. (2) Patent "Sun and Planet" (3) Collection of Trout Rods, Reels, Lines, Landing Nets, Artificial Flies, and Baits.

2. **HOVELL, BEXFIELD, W.,** St. Andrew's Works, Bedford Street, wich. Fishing Baskets, &c.


# THE LADIES' ROYAL YACHTING ULSTER

**BLUE CASHMERE LINED SCARLET.**

*SOLE MAKERS:*

**ANDERSON, ABBOTT, AND ANDERSON,**

*37, QUEEN VICTORIA* STREET, LONDON, E.C.

473. **HORNE, MISS,** Hampton Park, Hereford. Case of Trout F for England.

474. **REDPATH & CO.,** Fishing Rod and Tackle Manufactu (Wholesale and Export), Tweedside Works, Kelso, N.B. (1) Collection of Salmon R Reels, Lines, Flies, Baits, Gaffs, Spears, Creels, Bags, &c., &c. (2) Collection of Trout R Reels, Lines, Flies, Baits, Landing Nets, Baskets, &c. (3) Collection of Trolling, and Rods, Reels, Lines, and Baits. (4) Collection of Gut, Gut Lines, Hooks to Gut, Spin Tackle, &c.

475. **BARTLEET, WILLIAM, & SONS,** Abbey Mills, Reddit and London. H. Walker, Agent, 53 Gresham Street, E.C. Upright Case of Fishhooks Fishing Tackle of all kinds for Sea and Inland Fishing. Transferred from the Brit Museum of Economic Fish Culture. (Not for competition.)

476. **COOKE, ARTHUR,** 339 Oxford Street, London, W. (1) Walki stick Fishing Rods. (2) Sails, for Sailing on Skates. (3) Ice Sticks, &c. (4) S Walking Sticks. (5) Fishing Appliances.

478. **MACNEE, JAMES,** Loch Tummel Side, Pitlochry, Perthsh Case containing Salmon and Trout Flies with Pike Scale wings. Salmon Flies, Salmon Trout Phantoms, Trout and Salmon Casting Lines, and implements to enable the amate tie fly wings.

479. **DREW & SON,** 30 Piccadilly Circus, London, W. Articles m from Crocodile, Porpoise, and Seal Skins.

480. **FOOTE, HENRY G. B. W.,** Millfort, Mallow, Ireland. One d Artificial Trout Flies.

483. **GOLD, JOHN EDWIN,** 284 Waterloo Road, London, Fishing Rods made by Exhibitor, comprising Glued up Split Cane Trout Rods in six p Light Roach, Spinning, Trolling and other Rods, Winches and General Tackle.

484. **HYDE, W. DERBY,** Witney, Oxon. General Collection of Flie

485. **HOWARTH, SAMUEL,** 184 and 185 Station Street, Burton Trent. Case of Trout Flies, all tied by Exhibitor.

486. **PRAAG, ALEXANDER VAN, & SON,** 9 Crown Street, S London, W. Collection of Fishing Rods, Tackle, and Fishing appliances.

487. **ROBBINS, JOHN,** Latimer Place, Latimer Street, South mingham. Angler's Companion.

489. **GREGORY, JAMES,** 39 Vyse Street, Birmingham. (1) Gregory Baits (nickel plated). (2) The Gresham Baits. (3) The Flexible Cleopatra B (4) Gregory's Curved Baits. (5) Fishing Gazette Baits. (6) The Sportsman Baits The Clipper Baits and Spinners. (8) The Windsor Bee Baits. (9) The Wheeldon Sa Bait. (10) Gregory's Spotted Trout Baits. (11) Gregory's Paragon Baits. (12) Norwich, Colorado, Fishing Gazette, double and plain Spoons, in gilt and silver plated. Burt's Patent Spring Bait. (14) Gregory's Registered Archimedean Spinners for P Bait. (15) Gregory's Registered Spiral Indestructible Float Caps and Winch Fitting E (16) The "Bell's Life" Rod Rings. (17) Gregory's Artificial Metal Dace.

490. **MARTIN, JOHN WILLIAM,** 4 Northern Buildings, Low Lane, Newark-on-Trent. (1) Collection of Rods, Reels and Lines, Tackle suitable for Nottingham style of fishing. (2) 2 Pike Rods, 3 joints. (3) 2 Roach Rods, 3 joints. 2 Chub and Barbel Rods, 3 joints. (5) 1 General Rod, 4 joints. (6) 1 Combination R 6 joints. (7) Pike Reel and Line. (8) Reel, Lines, Floats, and Tackle for Bottom Fishing

492. **GAYNOR & SON,** 10 Royal Terrace, Richmond-on-Thames Surrey. (1) Pike, Barbel, and other coarse Fish Rods, Winches, and Tackle. (2) Artif Spinning Baits, Flies, and Insects, Gut and Gimp Pike Spinning. (3) Flights and Tra Floats for various kinds of Fishing, Landing Nets, Silk Lines, Spoon Baits, Paternoste Ledger Lines, New Metal Creel, Improved Double Slide Box Reel, Improved Slide Ro Snap Hooks, &c. (4) Eel Wheels or Traps. (5) Lampern Spurts as used in Thames Fishe (6) Apparatus for Catching Eels.

**G. LITTLE & Co.,**

FISHING-ROD AND TACKLE MAKERS.

**PATENT SOLESKIN PHANTOMS,**

**The most successful Bait ever invented.**

**15, FETTER LANE, LONDON, E.C.**

**RROW, A. J.**, 12 Pulford Street, Pimlico, London, S.W. (1) Grig amprey Weet. (3) Double Engine Trap. (4) Improved Eel Pot.

**ITHFUL, JAMES**, Houghton, Hants. (1) Eel pot for Weirs.

**NE FISHERIES**, Ballyshannon, co. Donegal, Ireland. (1) Weir with three Eyes and Watch House. Nets shown in Fishing order. (2) f Eel Weirs on River Erne.

**URT, CHARLES**, Plymouth Works, Redditch. Sole Inventor the Enamelled Brown Rust-Proof Fishing Hooks with Bayonet Points; also the ait Hooks for keeping the baits alive without injury of the vital parts of the fish.

**MMING & SON, T.**, Windsor Mills, Redditch. (1) Salmon (2) Hooks for Fly Dressing. (3) Double and Treble Hooks. (4) Registered d Baiting Needle. (5) Rods, Reels, and Lines.

**EFFIELD MANUFACTURERS' COLLECTION**, per M. or, Mayor of Sheffield. (1) Steel used for Fish Hooks. (2) Various Knives, Fishermen.

**LENTINE, GEORGE**, 77 High Street, Perth. (1) Portable of Fishing Appliances. (2) Sportsmen's Fishing Knives. (3) Portable Weigh- (4) Hook-Dressing Pliers. (5) Scissors, &c. (6) Fish Eating Knives, &c. ermen's Knives.

**ELSON, GEORGE M.**, Colville Mansions, London, W. Owner's tterns of Salmon Flies which won the Medal and Diploma at Berlin, and the wich. With the two medals in inscribed cases, with late successful patterns in se.

**OBERTSON, WILLIAM**, Fishing Tackle Merchant and Central Arcade, Hope Street, Glasgow. (1) Collection of Salmon Rods, Reels, asts, Artificial Minnows, Baits, Gaffs, Landing Nets, Bags, &c. (2) Complete regular, Refina, Padron, Salmon and Drawn Gut. (3) Salmon Flies for River hing. (4) Special Floating Flies for Scotch Loch. (5) Collection of Gut Casts, nows, Baits, Gaffs, Landing Nets, Bags, &c. (6) Trout Flies for River and . (7) Special Floating Flies for Scotch Lochs. (8) Complete Collection of Angling Appliances, for Fly and Bottom Fishing.

**KENE & GOODBRAND**, Mounthooly Ropework, Aberdeen. ishing Lines and Salmon Twine as used by the fishermen on the north and west nd.

**LACKWATER**, Coytrahen, Bridgend, South Wales. Case of

**ENNELL, HENRY**, 8 Powis Gardens, W. Collection of Poach- ts seized in various Salmon Districts of England and Wales.

**WEN, MOSTYN.** (1) Appliances for protection of Salmon ing. (2) Hitch and Brick Hitch. (3) Barrel.

DIVISION XIX.—[*West Gallery.*] *See Plan, p.* 76.

**Anglers' apparel of every description.**

**RDING, J. C., & CO.**, 19 Piccadilly, London. Anglers' water- of every description.

**DERSON, ABBOTT, & ANDERSON**, 37 Queen Victoria n. (1) Collection of Anglers' Waterpoof Apparel. (2) Fishing Waterproofs of tion for Anglers, comprising Fishing Boots, Trousers, and Stockings, Fishing Bags, Fishing Coats, Jackets, Capes, Hats and Gloves. (3) The Buckland ers, very light, requiring no separate Brogues. (4) The New Buckland Fishing tilated, affording absolute protection to the wearer in the roughest weather. rousers, Stockings and Brogues, various. (6) The Royal Fishing and Yachting dies, as supplied to the Queen. (7) Fishing Bags. The Walton, the Freke,

ERPROOF APRONS, TROUSERS,
PETTICOATS
R
PUNT FISHING.
MAKERS—
37, Queen Victoria St., E.C.
ANDERSON, ABBOTT, & ANDERSON.

(1) Samples of Anglers' Hatbands, for conveniently carrying artificial
(2) Samples of Hats for Anglers, shown in glass case. (3) The "Keeps
combination in a Sou'-Wester of Hat, Hood, and Cape. (4) Anglers' H

514. **DOWNING, T. H. & CO.,** Leicester. Speci
Knitted Jersey and Franklin Frocks for Seamen; also Ribbed Knicker
articles for Fishermen and Anglers.

516. **BAYLEY, MATTHEW,** Flamborough. Fisherm

516*a*. **DEAN, JOHN R.,** 423, 424, Strand, W.C.
"Cortex" Boots.

516*b*. **FAGG BROTHERS,** 29 Haymarket. Fisherm

516*c*. **BARKER, JOHN, & CO.,** High Street, Kensing
Apparel. (2) Waterproof Wading Boots for Fishermen's Apparel.

516*d*. **HAYLOCK, LEIGHTON,** 272 Victoria Street,
men's Boots.

516*e*. **HUTCHINSON, A., & CO.,** London, Paris, Ger
India Rubber Fishing Boots. (2) Men's Deck Boots and Yachtin
Yachting Boots. (4) The Orient Shoe (Mr. Gaussen's Patent). (5) Cl

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## Economic Condition of Fishermen.

Whilst the primary object of all International Industrial Exhibition
advancement of Art, Industry, and Commerce, they have not the less
the wonderful resources of human genius, skill, and labour. With
state of the division of labour, it is difficult, in many cases, to trace
any piece of work direct to the labourer himself. Hence the most
mechanical or hand industry are often only known by the names of
producers who happen to exhibit them. But in a Fishery Exhibition
difficulty in identifying the part which the labourer has taken in the
we are thereby brought in direct contact with the fisherman himself.

It may not be easy to give material illustration of the economic
nevertheless, we shall find it to a large extent reflected in the conditio
we see any fishery in the main carried on in little boats, owned by the fis
the same manner as the old handlooms in the silk industry, with more ha

the pilchard, the whale, the oyster, and many others. In all cases, however, the dustry is fitful and irregular in times and seasons, and subject to great alternations re, with long intervals of idleness, a circumstance which deeply affects the economic of the workers. In some localities the fisherfolk follow the fish; when the fishing in one locality, they proceed to another. In other localities the fisherfolk alternate nd agricultural labour; and in others, when fishing is ended, the fishermen engage s. But in all cases the occupation is of a most intermittent character, inconsistent sistent labour, and well fitted to encourage lassitude and laziness. The fishing on can scarcely be said to belong to the towns, though affected by many of the s of town life. All along the coast-line of the British Isles and other countries, yet in fishing ports of greater or less importance, there they live, a hardy, adventurous dy, at all hazards, to gather the inexhaustible spoils of the sea.

eral respects the fisherman's lot is worse than that of the agricultural labourer. It ed in the Report of the Royal Commissioners on Sea Fisheries, that whilst, once ar, an acre of good land, carefully tilled, produces a ton of corn, or two or three cwts. or cheese, the same area at the bottom of the sea on the best fishing ground may eater weight of food to the persevering fisherman every week in the year. Yet the those immediately interested are widely different. There are in the United Kingdom ,000 persons constantly, or occasionally, employed in fishing, who with their ts may be taken at 400,000, and the total annual value of the British fisheries is be over eleven million pounds sterling, giving an average produce of about £27 per lst about 3,300,000 persons employed in agriculture raise annually produce to the about £270,000,000, giving an average of about £82 per head. Accordingly the alling to the immediate workers respectively are very different. Whilst of the 00 produced by the fisheries scarcely thirty per cent., or £3,000,000 go to the pockets hermen, of the £270,000,000, the total produce of land, at least 25 per cent., or ,000,000, are spent in wages, giving in the case of the fishermen about £10 per head, of incomes from other occupations, and in the case of the agriculturist about head a year, or, taking two earners per family, less than 6s. a week for the fisherman, t 16s. a week for the agriculturist. Follow, moreover, a fisherman family and a the agricultural labourer in their homes. The fisherman's family have to pay £10 ear for house rent, the agriculturist £2 to £4 per annum. The agriculturist family ables in abundance always at hand, the fisherman's must purchase everything.

w is it that the fisherman gets comparatively so little of the produce of his labour? economy be effected in the disposal of the fish? Would not the contract of wages, uld leave the master free to economise the produce, prove more advantageous than ut system? Or would not a contract of partnership between the owners and the , in the shape of the Commandite principle, answer the purpose better still? What ne to render the industry more productive and more profitable? Could not steam introduced in British fishing vessels as the French have introduced in theirs? Are oats used too small in most cases? Are the gear and nets all that can be desired? t can be done to introduce more safety to life and property? Can the electric be better utilized for the announcement to fishing vessels already at sea of ng storms? Is there not great need of larger and more frequent harbours of refuge the coasts? Are the boats and gear sufficiently insured, or can any system of nsurance be safely introduced? Is life insurance sufficiently appreciated by our ? Exposed to constant danger, do they take advantage of that beneficial system to hat in case of loss of life their friends and relations shall not be left altogether The Post Office Savings Banks are extensively diffused. Do they enter all the nooks ers of the coast, so as to encourage thrift and self-reliance among all connected with ries? These are the questions which determine the economic condition of our .

rogramme of the Great International Fisheries Exhibition divides the subjects under into—1st. Apparel and Personal Equipment; 2nd. Food and Medicine Chest; 3rd. and Plans of Dwellings; and 4th. Contracts of Partnership, Insurance of Life, Boats, nd other branches, *however, will probably* be suggested at the conferences to be held *economic condition of fishermen.* A gracious Providence supplements the riches

the earth with the riches of the sea for the sustenance of the many millions of the [illegible] race. And it should be our endeavour, not only to advance as much as possible [illegible] conditions of the industry, but also to improve the economic condition for those [illegible] the same.

LEONE LEVI,
*Professor of the principles of Commerce and Com[illegible] Law, King's College, London.*

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DIVISION XXI.—[*East Arcade.*] *See Plan, p. 26.*

## Apparel and personal equipment.

**517. CALLEY & CO.,** 148 Fenchurch Street, E.C. (1) Samples [illegible] "Thésée's" Chemical Oil for the softening, preserving, and rendering waterproof [illegible] articles, such as Sea Boots, Fishing Lines, Pump and Fire Hose, Leggings, Harness [illegible] and samples of articles prepared therewith.

**518. ANDERSON, ABBOTT, & ANDERSON,** 37 Queen [illegible] Street, London. (1) Fishermen's Oilskin Apparel and Personal Equipment. (2) [illegible] Oilskin Clothing for Fishermen of all nations. (3) The Special "Captain's" Coat [illegible] "Admiral" Coat, with improved fly. (5) The "Plimsoll" Jacket. (6) The Super[illegible] bound French Coat, with Epaulets. (7) Trousers, Leggings, and Sou-Westers of every [illegible] to match Coats and Jackets. (8) Women's Fishing Skirts with Bibs. (9) Women's [illegible] Aprons, as supplied to the Newfoundland Fisheries. (10) Men's Fishing Vests, [illegible] without sleeves. (11) Seamen's Bags. (12) The Royal Yachting Coat, as worn by [illegible]

**518a. BAIN, MRS. GEORGE,** Eaton Road, Hampstead. Specim[illegible] Hand-knitting from the Shetland Islands.

**519. CHISIM, ANGUS,** 140 & 144 Corporation Street, Bel[illegible] With a Branch in Ardglass, Ireland. (1) Oilskin Trowsers, made closed up, without [illegible] fall, for hauling drift nets. (2) Oilskin Coat, no seam in the body, except the shoulder [illegible] Sou'-Wester, with piece round back of the head. (4) Oilskin Trousers, Jacket and [illegible] one. Irish Frieze. (5) Trousers and Double-breasted Sleeved Vest, made to button [illegible] or fold down at pleasure.

**520. ROSS, W. R.,** 23 Longate Street, Peterhead, N.B. Boots to be [illegible] by Fishermen at Sea.

**521. HENRY, JAMES HAY,** The Pharmacy, Macduff, N.B. Specim[illegible] of Linseed Oil, for use in the preparation of Fishermen's Waterproof Clothing.

**522. FORBES, WILLIAM,** 33 Duff Street, Macduff, N.B. A Specim[illegible] Suit of Clothing as worn by Moray Firth Fishermen.

**523. TIPPITT, SON, & CO.,** Plymouth, Fishermen's, Yachtsmen's [illegible] Seamen's Clothiers and Outfitters. Fishermen's Clothing.

**524. BRAND, H. & E.,** Broad Row and Trinity Quay, Great Yarm[illegible] (1) Grained Water-boots. (2) Entire Personal Equipment of Fishermen. (3) [illegible] Models of Fishermen dressed for Sea or Shore Service. (4) Fishermen's Oiled and [illegible] Clothing. (5) Hand-knitted and other Guernseys. (6) Hand-knitted Mittens and [illegible]

**525. CRAIB, JAMES, & SON,** 20 Duff Street, Macduff, N.B. [illegible] Fishermen's Sea Boots.

**526. WILSON, WILLIAM,** Albert House, High Street, Berwick-on-Tw[illegible] (1) Long Herring Fishing Boots. (2) Long Salmon Fishing Boots. (3) Knee Deck [illegible] (4) Knee Salmon Fishing Boots. (5) Wading or Shooting Boots. (6) Ladies' Rod [illegible] Boots. (7) Gentlemen's Rod Fishing Boots. (8) Gentlemen's Waterproof Wading [illegible] and Brogues complete. All Waterproof.

**527. WENTWORTH, MESSRS.,** 12 Museum Street, London, W[illegible] (1) Fishermen's and Sailor's Oilskin and other Coats rendered unsinkable. (2) Blue Ja[illegible] Unsinkable Suits for torpedo and other dangerous services. (3) Unsinkable Suits for [illegible] men on transfer service. (4) All kinds of Belts for Sailors, Fishermen, and Lifeboat [illegible] whole protected by three English patents. For articles for Ladies and Gentlemen [illegible]

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ANDERSON, ABBOTT, AND ANDERSON'S
INDIA-RUBBER MATS.
SUITABLE FOR
SHIPS, YACHTS, STEAMERS, CARRIAGES, ETC.

# METROPOLITAN
# rinking Fountain and Cattle Trough
## ASSOCIATION.
## SUPPORTED ENTIRELY BY VOLUNTARY CONTRIBUTIONS.

**es : Victoria House, 111, Victoria Street, Westminster, S.W.**

*President*—His Grace the Duke of Westminster, K.G. &c. &c.
*Chairman of Committee and Treasurer*—Joseph Fry, Esq.
*General Manager and Secretary*—John Lee, Esq., F.R.G.S.

**THIS IS THE ONLY AGENCY FOR PROVIDING**
**EE SUPPLIES OF WATER FOR MAN AND BEAST**
**IN THE STREETS OF LONDON,**

the relief it affords both to human beings and dumb animals is incalculable The total number of Troughs and Fountains now (March 31st, 1883) ted, and at work in the Metropolis, is as follows: **526 Troughs** for animals, **511 Fountains** for human beings, at which multitudes of men, women, children, horses, oxen, sheep, and dogs, quench their thirst daily, amounting e aggregate to probably not less than the enormous total of **250,000,000** kers in a year.

he Committee are urgently in need of and earnestly solict liberal contributions nable them to sustain and extend this simple scheme for the amelioration of nal suffering and the promotion of habits of temperance amongst our itinerant working population. Contributions may be paid to the Bankers, Messrs. rsom, Bouverie, & Co.; Messrs. Barclay, Bevan, & Co.; or to the General nager and Secretary, at the Office.

To those benevolent individuals who may be inclined to become Benefactors by Will to the ty, the following form is respectfully suggested:

*I give and bequeath the sum of to be paid out of such ts of my personal estate as can be lawfully applied for that purpose unto the asurer for the time being of a Society, called or known by the name of THE TROPOLITAN DRINKING FOUNTAIN AND CATTLE TROUGH IATION, to be at the disposal of the Committee for the time being of the Society."*

Note.—For the information and guidance of persons erecting Memorial or Gift Fountains er in London or the Country, a number of Models and Designs are on view at the Office; or the eral Manager will be happy to give all the advice and information in his power by letter, and rnish designs and cost of Fountains without charge.

528. **JOHNSON, J. W., & SONS,** Manufacturers, Great Yarm
(1) Life Saving Apparel. (2) Every description of Waterproof Oil Clothing, as
Fishermen of the British Isles and other parts of the world. (3) Waterproof Oil Cl
for Captains, Sailors, and Pilots. (4) Sou'-Westers for all parts of the world. (5)
description of Fishermen's Clothing, other than Waterproof, for sea and shore servic
Water Boots of all lengths. (7) Life-saving Garments, as worn by Life-boat Cre
Fishermen engaged in ferrying Fish from smack to carrier. (8) Waterproof Oil Cloth
all Garments for ladies and gentlemen Yachting and Fishing. (9) Ladies' Waterpr
Cloak fitted with Life-saving Apparatus.

529. **HALL, JOHN,** 20 Shore, Macduff, N.B. Collection of Fisher
Sea Clothing, other than waterproof.

530. **SIEBE, GORMAN AND CO.,** 147 Westminster Bridge Road,
Diving apparatus for sponges.

531. **PILKINGTON, W.,** 180 East India Dock Road, Poplar, Lon
Sample of 4 Pairs of Fishermen's Waterproof Sea Boots (Leather), suitable for wad
deep-sea fishing.

531*a*. **PREIST & CO.,** 514 Oxford Street, London, W. (1) Pr
Patent "Exeter" Fishing Knife. (2) New and improved Smoking Knives for Fish
(3) Pic-nic Knives, and Knives with Combination of Knife, Spoon, and Fork for Fish
(4) Fly-fishing Scissors—Gut Trimmers, Fishing Plyers, and Disgorgers, &c. (5)
Fish-weighers. (6) Knives and Scissors, specially for fishermen generally, knives
all necessary appliances for fishing purposes.

531*b*. **CORNWALL, COMMITTEE FOR.** For Details, see M
p. (10).

531*c*. **WHITING, H. G.,** 11 Poultry Chambers, Cheapside, Londo
(1) Fisherman's Magnetod Boots. (2) Magnetod Rowing Belt and Wristlets, Magnet
for Prevention and Cure of Rheumatism. (3) Universal Nerve Invigorator for the Pre
and Cure of Bronchitis. (4) Magnetod Drawers to prevent Cramp. (5) Swimmi
(Magnetod). (6) Magnetod Appliance for Prevention of Sunstroke. (7) Magnet
pliances, for every part of the body, for the Prevention and Cure of Scurvy, Ague, Lu
Sciatica, Amaurosis, &c. (8) Electric Life Reviving Apparatus. This apparatus
restoring the heart's action, and can be applied in a quarter of a minute to the m
out of the water, and in conjunction with the usual means employed. (9) Sea S
(Prevention) Apparatus. (10) Fisherman's Magnetod Coats, Cloaks, Caps, &c., to
the effects of damp and cold. (11) Magneto-Electric Machines and Electric Batte
many diseases connected with the sea. (12) Magnetod Hair, Flesh, and other Bru
cure Neuralgia and other nervous diseases. (13) Small Compasses, Thermometer, &c.

DIVISION XXII.—[*East Arcade.*] *See Plan, p.* 26.

## Food and medicine chests.

532. **WALKER & HARRISON,** Phœnix Biscuit Works, Ratcliff C
London, E. Samples of Ship Biscuits, Flour, Peas, Oatmeal, &c.

532*a*. **NEEDHAM, A. J.,** 14 Hammersmith Terrace, London. P
Atmospheric Fountain.

533. **NESTLE, HENRI,** 9 Snow Hill, London. (1) Condensed S
Milk. (2) Milk Food.

534. **HENRY, JAMES HAY,** The Pharmacy, Macduff, N.B. (1) S
mens of Fishermen's Medicine Chests. (2) Exhibit of Henry's "Marine Saline,"
Effervescent Preparation, containing some of the Saline Constituents of Seaweed and
water.

535. **MITCHELL & MUIL,** Biscuit Manufacturers, Aberdeen. Sa
of various kinds of Sea Biscuits used by Fishermen.

BY SPECIAL ROYAL APPOINTMENT.

**DAY, SON, & HEWITT'S**

**"ORIGINAL" STOCKBREEDER'S MEDICINE CHESTS.**

*CONTAINING THE "CHEMICAL EXTRACT," "GASEOUS FLUID," "RED DRENCH," &c.*

**Prices: £2 16s. 6d. and £6 6s. Carriage paid.**

**22, DORSET STREET, BAKER STREET, LONDON, W.**

**EDMUNDS, JOSEPH,** 134 Pentonville Road, London. Baking for making bread without yeast. (2) Egg powder, a substitute for making cakes, &c. Favourite Custard Powder, for making custards without eggs. (4) The ditto for Puddings, milk only required.

**MARCHANT, MRS. H.,** 29 Tabor Grove, New Wimbledon. ldier and Sailor" (oil painting). (2) "Lobster Pot," Isle of Wight (water colour).

**LIGGINS, HENRY,** 3 Ladbroke Square, Notting Hill. Block f Ship. (2) Half Model on mahogany board.

**PREVET, C., & CO.,** late **CHOLLET & CO.,** 134 Fenchurch London, E.C. (1) A glazed frame containing a "Mosaic," composed of Compressed les of various kinds, for use at sea, as regularly supplied to Her Majesty's Govern- (2) Two glass cylinders containing uncompressed Mixed Vegetables, and uncompressed e Vegetables, preserved, for short cruises. (3) A whole Cabbage preserved dry by ors' special process. (4) Samples of Compressed Mixed Vegetables and Julienne as and anti-scorbutic food for fishermen and especially whalers. (5) Three tins, one of one of 8 lbs. and one of 4 lbs., to show the three sizes of packages of Exhibitors' goods at sea. (6) Samples of various Consolidated Soups in tins, for use at sea.

**LINTON, R. T.,** Manufacturing and Pharmaceutical Chemist, rgh and Leith. Office, 8, Nicolson Street, Edinburgh. (1) Medicine Chests suitable hthouses, Yachts, Emigrant Ships, &c. Thermoplastic Splints, likewise Splints for es and Broken Bones.

**McCALL, JOHN, & CO.,** 137 Houndsditch, London. (1) Show Preserved Meats in tins. (2) Paysandu Ox Tongues. (3) Australian Beef and (4) Tasmanian Rabbits. (5)Western Meat Co.'s Rabbits.

DIVISION XXIII.—[*East Arcade.*] *See Plan, p. 26.*

## Models and plans of dwellings.

**ALLEN, EDWARD ELLIS,** 111 Cheyne Walk, Chelsea, S.W. nan's Cottage. This exhibit will be near Machinery in motion.

**MACLEAN, A. J.,** Pennycross, Argyleshire, N.B. (1) Communica- th Fishing Fleets at Sea. (2) Plans of Fishermen's Dwellings. (3) Plan of Peat Ice (4) Model Railway Van, for conveying fish to market. (5) Model Fish Box.

**DEAN, MRS. ELIZABETH,** 2 Godwin Road, Hastings. Model of rman's Dwelling House and Furniture.

**MACKENZIE, R.,** Master of Works, Campbeltown, Argyleshire, (1) Model of Fishermen's Houses. (2) Two Plans of Fishermen's Houses.

**GREENWOOD, WILLIAM, & CO.,** 60 Market Street. Man- Ventilators, for Dwellings. Patent New Style Ornamental Ventilators, in the form ques, brackets, and china, parian, Dresden, &c., vases and ornaments, suitable for ng-houses, saloons, &c.

**BREBNER, THOMAS,** Builder, Fraserburgh, Aberdeenshire. of Fishermen's Houses, with Plan.

**LAWRENCESON, L.,** Lerwick, Shetland. Model of Fisherman's e.

**a. CHAMBERS, OLDHAM, & WILLINS, MESSRS.,** Architects, Plain, Norwich. Plans of Fishermen's Waterside Dwellings.
Plan of Fish Market (Ground); (2) Plan of Basement and First Floor; (3) Plan of (4) Plan of Transverse Section; (5) Plan of Longitudinal; (6) Plan of Interior. n for Seamen's School. Design for Fishermen's Village. Bird's-eye View.

THE PATENT VICTORIA STONE,

**AS LAID in the Entrance Hall and Fish Market of the FISHERIES EXHIBITION, has been used by eighteen Metropolitan Vestries; sixty miles (taken at seven feet wide) having been laid in London footways, where there is the greatest traffic in the world.**

Wharf and Office :—283A, Kingsland Road.
Works :—Stratford, Essex; and Groby Quarries, Leicester.

## Division XXIV.

### Contracts of partnerships; insurances of, life, boats, gear, & benefit societies.

549*b*. **SHIPWRECKED FISHERMEN AND MARIN ROYAL BENEVOLENT SOCIETY, THE,** Hibernian Chambers, London (1) Frame with Testimonial. (2) Frame with Testimonial. (3) Frame with Fa (4) Annual Publications. (5) Quarterly Publications. (6) Gold Medals. (7) Silver (8) Other Medals. (9) Flags, &c. (10) Serial Issues and Pamphlets. [*West End boat Shed.*]

549*c*. **THAMES CHURCH MISSION TO SEAMEN, FIS MEN, &c. (THE),** 31 New Bridge Street, Ludgate Circus. Various Exhibits ill of the Society's important effort to reach the deep-sea fishermen by means of Missio cruising with the fleets. [*Entrance Hall.*]

549*d*. **BRITISH AND FOREIGN BIBLE SOCIETY,** 146 Victoria Street, E.C. Copies of the Holy Scriptures in whole or in part in 250 lang dialects. Scriptures at low prices supplied to Sailors and Fishermen. [*Corridor Market.*]

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## CLASS III.—COMMERCIAL AND ECONOMIC.

### Preparation, Preservation, and Utilization of Fish and all Forms of included in Class V.

This class has been divided into two groups, consisting (1) of those products of the f which by undergoing some process of preservation can be made available as useful of food for weeks, months, or even years after the fish so treated has been caught, others from which oils, manures, and materials applicable to mechanical, agricul ornamental purposes are obtained.

Attention may first be directed to the various modes of curing fish for edible p and these are mainly included under salting and smoking, although simply drying air is sufficient in some cases as a rough mode of preservation. In our own coun especially in Sweden and Norway among Continental nations, curing operations ha been extensively carried on, and wholesome competition between them to meet the ments of the German and other markets has done much to ensure the strictest attenti given to the selection of the best fish and all that is necessary for perfection in curing especially refers to what is known in this country as the "White herring cure," a m preservation which employs thousands of men and women in Scotland, and which a Board of Fisheries takes under its immediate superintendence, and certifies with its on the casks if the curing has been properly done, and the curers desire the offic The preparation of white herrings is very simple, and essentially consists in packing in salt, which soon turns to brine, and this method of preparation is termed the "wet The same method is applicable to other kinds of fish, particularly to cod and ling, a some little modification to pilchards, which in Cornwall and on the north coast of are largely cured for the Mediterranean markets. The great distinction between the ment of pilchards and other kinds of fish cured wet being in the fact of pilchards bei up in alternate layers of fish and salt on the ground for a few weeks before they are packed with salt in the barrels. By this treatment a considerable quantity of oil obtained from them, and the fish are rendered more palatable. The numerous exa fish from various countries cured by merely salting and drying show how much may in preserving fish for food with little trouble and at a trifling cost. The important of Newfoundland well represent this method of curing. Another mode of preserv that so familiar on our tables in the form of sardines cured in oil. This method is to several kinds of fish in foreign countries, but has been only tried in our own w last few years, and that with young pilchards, the fish which in France are so largely and sold under the name of sardines.

Curing with salt and smoke is a more elaborate process, which is especially carr in this country, and the several models of curing-houses here exhibited well illust manner in which red herrings, bloaters and kippers are prepared for the home and markets, and will be examined with general interest. This mode of curing has bee

ly extended within comparatively recent years. Many people will be surprised to hear hardly more than thirty years ago, when trawling was beginning to be systematically d on in the North Sea, haddocks were caught in such vast numbers that there was ly any market for them, and the fishermen were ordered to bring only a certain ber ashore. Tons of them were then thrown overboard again; but the plan of smoking fish was suggested and proved so successful that quite a new industry resulted from it, now smoked haddock is so abundant that it comes within the reach of almost the poorest e population. The preservation in tins of everything which may be roughly included r the head of fish forms another very important industry, especially on the other side Atlantic, and large supplies are sent to this country, much of it to be again exported er the world as well as for consumption on board ship; and this in addition to the known productions of our own manufacturers. The universal demand for fish in some , whether fresh or preserved, is constantly increasing; and when it is remembered rally good fish is only found in any abundance in temperate or cool climates, and that atively few countries are fortunate enough to possess a favourable coast under such ions, the advantages of being able to preserve fish in a fit state for food for long so as to bear carriage all over the world cannot fail to be properly appreciated.

addition to the various kinds of cured or preserved fish, numerous articles coming the head of fish products deserve some attention. Such are medicinal oils, roes, , gelatine and isinglass. These are for the most part the productions of northern s, and wherever the cod fishery is carried on with the object of curing the fish, the and roes are carefully kept, and form an appreciable item in the results of the fishery. matter of some interest that the success of the sardine fishery in the Bay of Biscay is dependent on the fishermen being supplied with plenty of cod-roe. It is used as bait, er being broken up, the separated grains are plentifully scattered among the nets as oat in the water, and the sardines in their eagerness to obtain this attractive food, eir way into the nets and are caught. Caviare, one of the peculiar products of Russia, ared from the roe of various species of sturgeon, and undergoes little preparation salting and pressing; but many examples will be observed among the productions er countries, especially of Sweden, of the roes of several kinds of sea fish prepared same manner as the original Russian caviare. The refuse of fish is utilised to some by being converted into manure or fish guano; and sprats in this country during the of the special season when these fish are most abundant and the ordinary markets ted with them, are sold in thousands of bushels direct from the fishing vessels, and d inland by the neighbouring railways to be thrown on the fields. The different oils d from sundry kinds of fish, seals and whales, will attract attention from the many uses h they are applied, especially for lubrication, and the true fish oils have a special n the preparation of leather of various kinds.

arls, mother-of-pearl and tortoiseshell being the special productions of warm climates, t represented in the exhibits of some of our colonial possessions and countries near the . Ceylon pearls have been famous for centuries, and still take their place in the , although the supply is small compared with that from the Persian Gulf and a few ocalities. The shells of the pearl oyster are represented in various stages of growth and g the nacreous lining of the same material as that of which the pearl itself is entirely ed. The mother-of-pearl, as this substance is called, is in these oysters too thin and to be useful for manufacturing purposes, and this beautiful material, so much used for ntal work, is obtained from a much larger oyster, the shell of which is thick and , and whose value depends almost entirely on the shell itself, and not on the small produced in it. A large collection of objects will attract attention from their beauty e variety of purposes to which the skins of certain kinds of fish and reptiles are , notwithstanding their unpromising nature; and much interest will be felt in the ul display of coral, tortoiseshell and shell ornaments, and the several methods by they can be turned to account.

eturning once more to the large subject of obtaining an abundant supply of fish as an of food, we find numerous appliances for keeping the fish cool during transport from to the market, and this section deserves careful examination, as the main principle of

refrigeration or cooling here illustrated has an important bearing on the question of trans ing other kinds of perishable food from distant countries. Finally, attention may be dir to the several plans and models of fish-markets with their arrangements for the quick rece and delivery of the fish, and altogether it will be noted that large as are the intere those concerned in the actual fisheries, those connected with the transport, preser and disposal of the fish are hardly less important.

E. W. H. HOLDSWORTH, F.L.S.

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## DIVISION XXV.

## COMMERCIAL AND ECONOMIC.

**Preparation, preservation, and utilisation of fish, and all form life included in Class V.**

DIVISION XXVI.—[*Corridor to Fish Market.*] *See Plan, p.* 70.

**Fish dried, smoked, cured, salted, tinned, or otherwise prep for food.**

(*a*) For edible purposes—

Models of fish-curing establishments. Methods of, and models and other representati any appliances for, drying, curing, salting, smoking, tinning, cooking, &c.

550. **SAYER & CO.**, 100 Lower Thames Street and Billingsgate, Lo Model of Fish Curing Establishment, with all the latest improvements. Model of Billing Market.

551. **ALLEN, EDWARD ELLIS**, 111 Cheyne Walk, Chelsea. M and Drawing of Fish Market, &c.

552. **FISHERY BOARD FOR SCOTLAND**, Edinburgh. (1) W Herring Cran Measure (1). (2) White Herring Barrel (1). (3) White Herring Barrel (1). (4) Six Gauging Instruments, viz., Set of Callipers (2), Slide Rule (1), Dip Rod (1), Imperial Gallon Measure (1), one-third Gallon Measure (1). (5) Five Iron Irons, viz., Crown "Full" Iron (1), do. "Mat." Iron (1), do. "Spt." Iron (1), do. "P" Iron do. Cran Iron (1).

552*a*. **BARRON, R.**, Macduff, N.B. Herring Barrel.

553. **PARK, J. & T.**, Fish Curer, Fraserburgh, N.B. Model of Curing Establishment, made to a scale.

554. **SOFTLEY, R. T.**, 63½A King Street, Great Yarmouth. Model a Fish Curing Establishment.

555. **MOIR, JOHN, & SON, Limited**, 148 Leadenhall Street, Lo E.C. Factories: London, Aberdeen, Seville (Spain), and Wilmington (Del. U.S.A.) Models of Smoking Houses for Findon Haddocks, Kippered Herrings, and Red Herrings. Exhibits of English, Scotch, and American Smoked, Dried, and Preserved Fish, in glass tins, including Salmon, Findon Haddocks, Turbot, Whitebait, Soles, Lobster, Sturgeon, Potomac Herrings, &c. (3) Bag-Net for Salmon Fishing and Models of Smoke Houses.

556. **DICKSON & RENWICK**, of London, Liverpool, and Glasgow 39 Lombard Street, London. (1) Salmon. A. Booth's Brand. (2) Oysters. A. Brand. (3) Lobster. Forrest & Co.'s Brand. (4) Salmon. Sovereign Brand. Tall Columbia River. (5) Salmon. Sovereign Brand. Flat tins. Columbia River. Mackerel. Sovereign Brand. (7) Herrings. Sovereign Brand. (8) Lobster. Sov Brand. Tall tins. (9) Lobster. Sovereign Brand. Flat tins. (10) Oysters. Sov Brand. (11) Clams. Sovereign Brand. (12) Shrimps. Sovereign Brand. (13) Salmon Smoked. Sovereign Brand.

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JOHN MOIR & SON, LIMITED,

Preserbers of Fish, Soups, Meats, and Vegetables.

ESTABLISHED 1822.

**For Particulars of Exhibit see page 67.**

# JOHN MOIR & SON,

LIMITED,

## LONDON, ABERDEEN, SEVILLE, AND WILMINGTON

(DELAWARE, U.S.A.).

Purveyors to H.R.H. the Prince of Wales.

*Exhibit from their London, Aberdeen, and American Factories, the undernoted Fish, preserved in glasses and tins—*

**HERRINGS.**—Fresh Herrings, Kippered Herrings, Red Herrings, Devilled Herrings, Herrings in Shrimp Sauce, Tomato Sauce, and Fennel Sauce; Pickled Herrings, Herrings à la Sardines, Digby Chicks, Potomac Pickled Herrings, Fried Herrings, Spiced Herrings.

**HADDOCKS IN GLASSES.**—Fresh Haddocks, Findon Haddocks, Haddock Roes.

**SALMON IN GLASSES AND TINS (Scotch).**—Fresh Salmon, Collared Salmon, Salmon Cutlets, Salmon Cutlets in Sauce, Salmon Cutlets in Oil, Pickled Salmon with Vinegar, Salmon Cutlets in Indian Sauce, Kippered Salmon.

**COD FISH IN GLASSES.**—Fresh Cod, Compressed Cod, Cod Roes, Cod Fish Balls, Smoked Cod Roes, Cod Sounds.

**LING FISH IN GLASSES.**—Fresh Ling.

**TURBOT IN GLASSES AND TINS.**—Fresh Turbot, Turbot Cutlets.

**POTTED FISH IN GLASSES AND TINS.**—Lobster, Salmon, Shrimp, Bloater Paste, Anchovy Paste, Potted Turtle Meat, Potted Crab, Potted Findon Haddocks.

**MACKEREL.**—Fresh Mackerel, Kippered Mackerel, Mackerel in Sauce.

**SOLES IN GLASSES.**—Soles, Fried Soles, Fillets of Soles.

**LOBSTERS IN GLASSES AND TINS,** also Curried.

**OYSTERS IN GLASSES AND TINS.**—Fresh Oysters, Pickled Oysters, Curried Oysters.

**ANCHOVIES IN GLASSES.**—Gorgona, ditto in Oil.

**FISH SOUP IN GLASSES AND TINS.**—Fish Soup white, Terrapin Soup, Green Turtle Soup for Invalids, Real Turtle Soup clear and thick, Lobster Soup, Oyster Soup, Mulligatawny Fish Soup, Bouillabaisse, or French Fish Soup.

**VARIOUS FISH IN GLASSES.**—Green Turtle, Sturgeon, Sturgeon Cutlets, Potomac Herrings in Jelly, Chesapeake Bay Rock Fish, Delaware White Perch, Delaware Shad in Jelly, Florida Red Snapper, New England Brook Fish, Brandy Wine Suckers, Delaware Perch, Susquehanna Yellow Perch, Delaware Rock Fish in Jelly, Eastern Shore Common Terrapin, Chinconteague Sound Diamond Back Terrapin in Jelly, Red Snapper Cutlets, Red Snapper Cutlets in Jelly, Red Snapper Cutlets with Oyster Sauce, Broiled Shad, Dried Sprats, Russian Caviare, Soft Speldings, Whitebait.

**SHELLS.**—Diamond Back Terrapin.

**SAUCES.**—Fish Sauce, Essence Anchovies, Essence Shrimps, Essence Lobster, Indian Sauce for Salmon Cutlets.

**CURRY POWDER.**—Specially prepared for Fish Curries.

**SARDINES.**—Sardines in Oil, Sardines in Butter, Sardines boneless, Sardines with Tomatoes.

557. **SUTTON, G. F., & CO.,** White Horse Yard, 100 High H London. (1) Gorgona Anchovies as imported, in original package. (2) Set of San preparations of the above. (3) Specimen glasses: Fish prepared in various ways.

558. **PENEAU, JOSEPH,** 6 Martin's Lane, Cannon Street Street, E.C. Collection of Samples of Sardines in Oil, in Tins of various sizes.

559. **LATHAM, A. W., & CO.,** as Agents. 17 Philpot Lane, Londo (1) Barataria Prawns in one and half lb. (nominal) Tin Cans. (2) Barataria Oyster lb. (nominal) Tin Cans. (3) The same Article put up in Alcohol in Show Glas Columbia River Salmon, in one lb. Tall and Flat Tin Cans. (5) The same Article pr its natural form in a large Tin Can.

560. **MACONOCHIE BROTHERS,** Raglan Works, Lowestoft, S Tinned Herrings, Mackerel, and other Fish.

561. **TULLOCH, WILLIAM & SON,** Export Provision Manufac 26 & 27 Bury Street, London, E.C. (1) Preserved Salmon in Tins. (2) Preserved in Tins. (3) Preserved Fresh Herrings in Tins. (4) Kippered Herrings in Ti Bloater Herrings in Tins. (6) Herrings à la Sardine in Tins. (7) Finnan Haddocks (8) Sardines and Sprats in Tins. (9) Oysters in Tins. (10) Bloater Paste in Tins Anchovies, &c., in bottles. (12) Fish Sauces in bottles. (13) Prawns in Tins.

562. **EDGAR, JAMES & CO.,** 23 Rood Lane, London, E.C., and End Factory, Deal. Various Preserved Fish in Tins.

563. **BARROW, GEORGE,** 118 Lower Thames Street, London. of "High Dried" or "Red" Herrings, Samples of various qualities. Specially cu Home Consumption and Exportation. Will keep thoroughly sweet for six months at le most nutritious article of food, and only requires to be more generally known to be appre

564. **BUSH, MRS. ISAAC,** Alma Street, Wivenhoe, nr. Colchester, E Two Bottles, and two Jars of Cooked Pickled Sprats.

565. **BELLIS, THOMAS KERRISON,** 10 Jefferys Squar Mary Axe, London, E.C. (1) Samples of Sun-dried West India Green Turtle Ca Calipee, and Fins used for making real Turtle Soup. (2) Samples of Preserved Green Calipash and Calipee in Tins and Bottles. (3) Samples of Turtle Green Fat. (4) Sa of Turtle Soup ready for use, in Tins and Bottles.

566. **GILLON, JOHN, & CO.,** Leith, N.B. Preserved Fish in Ti Salmon, Salmon Cutlets, Mackerel, Fresh Herrings, Kippered Herrings, Herring à la Se Findon Haddocks, Red Herrings, and other Fish; also Turtle Soup, Anchovy Pas Bloater Paste.

567. **NOEL, LUDOVIC,** 43 Frith Street, Soho, London, W. Sar Herrings, Tunny Fish, Lobster, Salmon, Norwegian Anchovies, Anchovies in salt, Ans in oil, Curried Lobster, Astrachan Caviare and Fish Sauce.

568. **CROSSE & BLACKWELL,** Soho Square, London, and Morri Quay, Cork. Fish cured, salted, spiced, and otherwise prepared for food, in tins, bottles an

569. **OVERALL, S., SON, & CO.,** 102 Lower Thames Street, and Wapping Wall, London, and Peterhead, N.B. (1) Dried Fish in various packages for Ex Salted, Pickled, and Preserved Fish (various), in Tins, Bottles, Kegs, Barrels, &c. Herr Smoked, Pickled, and Preserved in Barrels, Kegs, Tins, &c. (2) Fish Oil.

570. **BLANCHFLOWER & SONS,** Fish Curers, Exporters, Impor and Manufacturers of Fish Sauce, Pickles, Jams, Jellies, and Preservers of Fish, Meats, Soups, Vegetables, Sausages, &c., for Yachts and Shipping purposes; and also Italian housemen, King Street, Great Yarmouth. Tinned, Dried, Smoked, Cured, and Salted Fi

571. **BURGESS, JOHN, & SON,** 107 Strand, London. Sample Preparations of Anchovies, viz.:—(1) Gorgona Anchovies as cured. (2) Gorgona Anch prepared in Brine, Vinegar, Oil, Butter. (3) Gorgona Anchovies, prepared as Sauce

572. **KING, ROBERT,** 32 Sussex Place, S. Kensington, London. Sal in various forms, Sardines, Lobsters, Prawns, Tunny, Char, Lax, Cod, Haddock, Herr Oysters, &c., Isinglass, Roes and Oils.

**These articles are very easy, light, and portable, and invaluable to Invalids and Travellers.**

**AIRPROOF BEDS, PILLOWS, & CUSHIONS.**

WORKS:
LIMEHOUSE, E.

37, Queen Victoria St., London, E.C.

**ANDERSON, ABBOTT, & ANDERSON.**

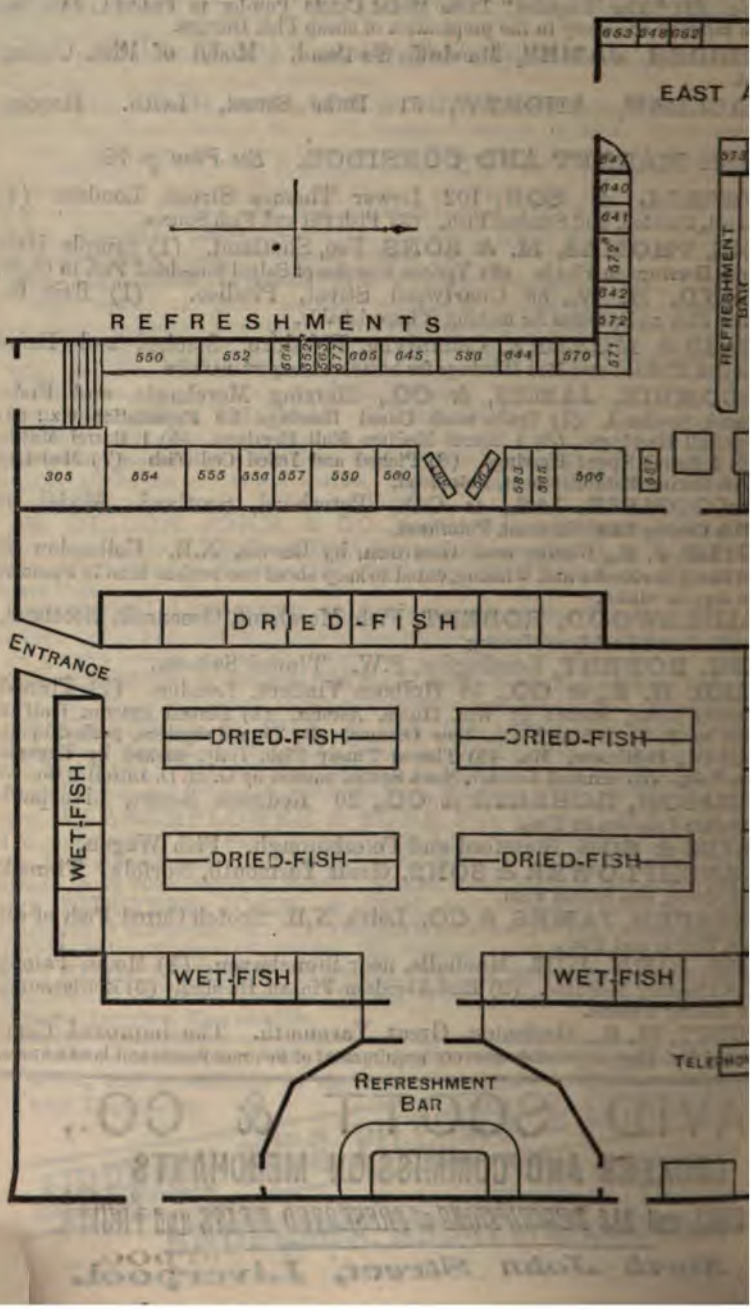
572*a*. **PERRY, W. T. L.**, Penzance. Cured Pilchards and Dried Fish.
572*b*. **SULLIVAN, A.**, Newlyn, Cornwall. Pickled Pilchards.
572*c*. **CORNISH SARDINE COMPANY,** Mevagissey. Cornish dines.
573. **EDMUNDS, JOSEPH,** 134 Pentonville Road, London. (1) Samples nchovies in Brine, Vinegar, and Oil. Essence of Anchovies, Coloured and Uncoloured, hovy Paste. (2) "The Empress" Prize Medal Currie Powder in Packets, from One ny each, a valuable accessory in the preparation of cheap Fish Dinners.
573*a*. **GEDDES, JAMES,** Macduff, Scotland. Model of Fish Curing blishment.
573*b*. **MACLEAN, ANDREW,** 51 Duke Street, Leith. Herring ets.

**FISH MARKET AND CORRIDOR.** *See Plan, p. 70.*

575. **OVERALL & SON,** 102 Lower Thames Street, London. (1) erved, Salted, Pickled, and Smoked Fish. (2) Fish Oil and Fish Sauces.
576. **ADIE, THOMAS, M. & SONS,** Voe, Shetland. (1) Sample Half el of White Herrings in Pickle. (2) Various Samples of Salted Sun-dried Fish in Cases.
577. **BRAND, H. W.,** 58 Charlwood Street, Pimlico. (1) Bait for (2) Raw Fish and process for making it imperishable.
578. **SHARP & MURRAY,** Cellardyke, Fifeshire. Smoked and Dried Pickled Cod, Pickled and Red Herrings for home and export markets.
579. **McCOMBIE, JAMES, & CO.,** Herring Merchants, and Fish-, Peterhead, Scotland. (1) Trade mark Cured Herrings, for Exportation, viz.: (2) el Large Full Herrings. (3) 1 Barrel Medium Full Herrings. (4) 1 Barrel Mattie gs. (5) 1 Barrel Spent Herrings. (6) Picked and Dried Cod Fish. (7) Model of itors' Fish Curing Establishment, Peterhead.
579*a*. **McCOOMBIE, JAS., & CO.,** Peterhead, Scotland. Model of itors' Fish Curing Establishment, Peterhead.
582. **BOYLE, J. S.,** Forfar and Gourdon, by Bervie, N.B. Collection of Smoked Cured Haddocks and Whiting, cured to keep about one week at least in summer, out ten days in winter.
584. **CALDERWOOD, ROBERT,** Fish Merchant, Greenock, Scotland. alf Barrels Cured Lochfyne Herring.
585. **KING, ROBERT,** Kensington, S.W. Tinned Salmon.
586. **WARD, H. S., & CO.,** 58 Holborn Viaduct, London. (1) Tinned , Columbia River, packed by Wm. Hume, Astoria. (2) Tinned Prawns, Gulf of , packed by T. T. White & Co., New Orleans. (3) Tinned Oysters, packed by L. ray and Co., Baltimore, Ma. (4) Tinned Tunny Fish, Italy, packed by Eugenio Genoa, Italy. (5) Tinned Lobster, Nova Scotia, packed by G. M. D. Littell & Co.
586*a*. **SIMPSON, ROBERTS & CO.,** 20 Redcross Street, Liverpool. ed Canadian Lobsters in Tins.
587. **HAYES & SON,** Stamford and Peterborough. Fish Wagon.
588. **BLANCHFLOWER & SONS,** Great Yarmouth, Norfolk. Tinned, Smoked, Cured, and Salted Fish.
589. **METHUEN, JAMES, & CO.,** Leith, N.B. Scotch Cured Fish of all n Boxes, Barrels and Tins.
590. **ROSS, JOHN, JUN.,** Muchalls, near Stonehaven. (1) Model Patent atic Fish Cleaning Machine. (2) Real Aberdeen Finnan Haddies. (3) Refrigerating tus for Fishing Vessels.
590*a*. **SCOTT, W. S.,** Gorleston, Great Yarmouth. The improved Com- n Fish and Net Cart applicable to every requirement of fish merchants and boat owners.

DAVID SCOTT & CO.,
BROKERS AND COMMISSION MERCHANTS
LOBSTERS, and ALL DESCRIPTIONS of PRESERVED MEATS and FRUITS.
*9, North John Street, Liverpool.*

# FISH MARKET



EAST
REFRESHMENTS
REFRESHMENT BAR
DRIED-FISH
ENTRANCE
DRIED-FISH
DRIED-FISH
DRIED-FISH
DRIED-FISH
WET-FISH
WET-FISH
WET-FISH
REFRESHMENT BAR

1. **KNOWLES, JAMES,** Fish Curer, Stonehaven, Scotland. (1) Smoked nd Ling. (2) Dried Salt Cod and Ling. (3) Smoked Yellow Haddocks. (4) Smoked oasted Haddocks. (5) Pickled Cod Fish. (6) Salt Herrings in Barrel, &c.

1*a*. **ROSS, J., JUN.,** Muchalls, near Stonehaven. Refrigerator in Box for ransport of Fish.

2. **CRAWFORD, A. O.,** Wick. (1) One Barrel White Herrings. (2) Barrel Red Herrings. (3) One Barrel Pickled Cod.

4. **SIMPSON, J.,** Wick, N.B. (1) One half barrel of white salted gs. (2) One empty half barrel. (3) One empty whole barrel.

5. **STEPHEN, ROBERT,** Fish Curer, King Street, Peterhead. One l of Cured Pickled White Herrings.

6. **MOWAT, ROBERT,** Fish Curer, Lybster, N.B. (1) Pickled ngs of Lammas Cure 1882. (2) Pickled Codfish. (3) Bottle of Pickle for Cod. (4) mens of Herring Barrels.

7. **DAVIDSON, PIRIE & CO.,** Fish Curers, Leith. (1) One Barrel outh Red Herrings (Cured for Home Market). (2) One Barrel Scotch (West Coast) l for Home Market). (3) One half Barrel full of White Herrings (Cured for Continental t.) (4) Two half Barrels Yarmouth Herrings (Cured for Home and Irish Markets). o Firkins gutted and ungutted, Loch Hourn White Herrings. (6) Two Kegs Lockfyne gs (Cured for Home Market). (7) Half Barrel and six Tins Yarmouth Reds (Cured for al Market).

. **BRIDGMAN, H. H., F.R.I.B.A., CAYLEY, J. J., AND BOYES, J.,** ltry, E.C. Scheme for Wholesale, Semi-wholesale, and Retail Fish Market for London, n Waterloo Bridge and Charing Cross Railway Bridge, Lambeth side of the Thames, g reclaimed foreshore, with communication by Rail (on to the Market floor), River and Plans, Models, &c.

9*a*. **CHAMBERS, OLDHAM & WILLINS,** Architects, Bank Plain, ch. Plans and Designs for Inland or Waterside Fish Markets.

9. **MITCHELL, JOHN,** Fish Curer, Whitby. (1) 5 Kits Black Her- (2) Boxes Smoked Herrings. (3) 5 Firkins White Herrings, in Brine.

1. **CAMPBELL, ROBERT,** 13 Breadalbane Crescent, Pulteney town, N.B. (1) Fished Dried, Smoked, Cured, Salted, Tinned, or otherwise prepared for Food. ne Barrel Cured Cod. (4) Two Barrels Pickled Herrings (measurement of one Barrel . (5) Two Half Barrels Pickled Herrings (measurement of one half Barrel given). alf Barrel Cod Sounds.

2*a*. **CARR, HOLMES, SONS & CO.,** Limited. Wholesale Fish- ants, Berwick-on-Tweed. Salmon, Kippered and Fresh Herrings, &c., &c.

2*b*. **SCOTT, WILLIAM, S.,** Gorleston, Great Yarmouth. Improved ination Fish and Net Cart.

4. **HILTON, W. H.,** 130 Victoria Street, Bristol. Patent Ventilating gerators, for preserving fish without ice.

5. **SCHREIBER, C. G. VON,** Saint Margaret's College, Lowestoft. of (1) "The Royal Pickled Herring." (2) The Queen's Herring Rolls. (3) Ye Royal ng Ragout. (4) Capt. Schreiber's Pickled Sprat Anchovy. (5) Improved Method for g Pilchards for home consumption. (6) Capt. Schreiber's "Campaign Sauce."

6. **CORMACK, JOHN,** Fish Curer, Lybster, N.B. Barrel (1) Crown Branded Herrings. (2) Crown Full Branded Herrings. (3) White Herrings, Cured tted. (4) Codfish Cured in Pickle. (5) Cod and Ling Cured, Dried. (6) Two Kits Sound. (7) Fish Dried, Smoked, Cured, Salted, Tinned, &c., for food. (8) Herring l and Half Barrel, New. (9) One Box of Kippered Herrings.

G. LITTLE & CO.,
FISHING ROD AND TACKLE MAKERS
To their Royal Highnesses the PRINCE and PRINCESS of WALES.
15, Fetter Lane, London, E.C.

**608. DAVIDSON, WILLIAM, JUN.,** Fish Curer, Pulteneytown, Wick. One Whole Barrel White Cured Herrings, original packing, ordinary cure for export to Baltic, cured in August 1882. (2) One Half Barrel White Cured Herrings, original packing, ordinary cure for export to Baltic, cured in July 1882. (3) One Half Barrel White Cured Herrings, original packing, ordinary cure for export to Baltic, cured in August 1882.

**609. GARRIOCK & CO.,** Shetland. (1) Case containing about 1 cwt. Dried Salted Codfish, 1st quality, of which more than 1000 tons are exported annually to Spain, where it commands the highest price of any dried fish. It is there called "Bacalao Escocia." (2) Case containing about 1 cwt. Dried Salted Ling fish, 1st quality, as exported to all parts of the world, in casks or tin lined cases. (3) Case containing about 1 cwt. Dried Salted Tusk fish, caught in comparatively small quantities, mostly consumed in Scotch Markets. (4) Case containing about 1 cwt. Dried Salted Saith fish, prepared for and mostly consumed in Ireland.

**610. GILLINGS, JAMES,** 19 Havelock Road, Great Yarmouth. (1) Collection of Cured Fish. (2) In East Arcade—Curing Establishment upon a new and improved principle. (3) Working Model of a Fish-Curing Establishment, at work daily outside Fish Market.

**611. SCHELL, FELIX,** 81 Wigmore Street, London, W. (1) Live Foreign Crayfish, in various sizes and varieties. (2) Fish Soups (preserved). (3) Soup prepared from Crayfish.

**612. WOODGER, EDWARD, & SON,** Fish Merchants and Curers, Lowestoft, Scarborough and Peterhead. Collection of cured fish of various kinds—Bloaters, Herrings, Red Herrings, Kippers, Bloaters, Finnan Haddocks, Pickled Haddocks, &c.

**613. STACY-WATSON, C. & CO.,** Yare Fishery Works, Great Yarmouth. (1) Samples of Smoked Herrings (Silver Cure) in barrels for exportation. (2) Samples of Smoked Herrings (Golden Cure) in barrels for exportation. (3) Samples of Ham-Cured Bloaters in tins. (4) Samples of Red Herrings in kits. (5) Samples of Yarmouth Golden Digby Chicks in tins hermetically sealed. (6) Samples of Pickled White Salted Herrings in barrel. (7) Samples of White Salted Herrings in tins. (8) Samples of Gipped Herrings in barrel. (9) Samples of Ham-Cured Herring in Anti-Pilferage Package, for safe transit of fish.

**614. BARROW, G.,** 118 Lower Thames Street, E.C. Dry Fish.

**615. BARBER, S. & CO.,** 111 Lower Thames Street, E.C. Shell Fish.

**616. WILLIAMSON, L.,** Burravoe, Shetland, N.B. (1) Salted Dried Ling. (2) Salted Dried Tusk. (3) Salted Dried Cod.

**617. SAYER & CO.,** 100 Lower Thames Street, and Billingsgate, London. Dried Fish of all kinds.

**618. BARROW, H. & CO.,** 24 Botolph Lane and Billingsgate. Smoked and Shell Fish.

**619. DOULL, GEORGE,** Fish Curer, Wick, Caithness, Scotland. (1) Cured Herring in barrels and boxes. (2) Cured Cod in barrels and boxes. (3) Two barrels Pickled Herrings, Government brand, crown full. (4) Two half-barrels Pickled Herrings, Government brand, crown full. (5) Two quarter-barrels Pickled Herrings. (6) One barrel Pickled Cod. (7) Two boxes Smoked Herrings.

**620. DARNELL, JAMES W.,** Shell and Dried Fish Merchant, 123 Lower Thames Street, London, E.C. Wet Fish.

**621. GEDDES, JAMES,** Macduff, Scotland. Herrings Salted, Cured in Brine, Codfish Cured in Pickle, Codfish Dried, Home and Foreign Market. Haddocks Cured, Smoked, and Dried, &c.

**623. TOWELL, H. J.,** 33 Strand, W.C. Wet Fish.

**624. CHARLES, J. S.,** 9 Lower Grosvenor Place, S.W. Wet Fish.

**625. SMITHERS, GEORGE, & SONS,** Cannon Street Station, E.C. Wet fish of all kinds.


C. STACY-WATSON AND CO.'S

CELEBRATED

YARMOUTH HERRINGS.

**For Price List address—Yare Fishery Works, Gt. Yarmouth, England.**

**SIX HIGHEST AWARDS.** *Norwich, Great Yarmouth, London*

**GRIMSBY COMPANY.** Wet Fish.
**OVERTON,** Victoria Station. Wet Fish.
**HALL, JOHN,** 15 High Street, Kensington. Wet Fish.
**WYATT, JAMES,** 123 Gloucester Road, South Kensington, S.W.

**STUART & CO.,** 8 Thomas Street, Edinburgh. (1) Slab of ic Paving for Fish Markets and Fishermen's Houses. (2) Patent Granolithic Tank.
**LAWRENCE.** Wet Fish.
**PUTNAM.** Wet Fish.
**VIGO, D.,** Belgravia. Wet Fish.
**APPLEYARD, J. F.,** 110A Waterloo Road, S.E., 77 Bishop's Road, , and Railway Approach, Waterloo Station. Wet Fish.
**GOW.** Wet Fish.
**SMITT, F. A.,** Sweden. Specimen Fish.
**HOLMES, ROBERT & SON,** Berwick-on-Tweed. Wet Fish.
**JACOBS, J.,** 80 Lower Thames Street, and Billingsgate. Wet Fish.
**BERTRAM & ROBERTS,** Crystal Palace. Wet Fish.
**FRYER, C. E.,** Home Office. Tinned Pilchards, in oil, *à la sardine*, as the "best and most improved mode of curing pilchards so as to make them au ood for home and foreign consumption."

DIVISION XXVII.—[*Corridor to Fish Market.*] *See Plan, p.* 70.

**ducts prepared from fish, such as oils, roes, isinglass, &c.**

**KELLY & SONS,** Wick, Scotland. John o' Groat Sauce, "The auce of Scotland."
**SOUTHALL BROS. & BARCLAY,** Birmingham. (1) Cod Liver od Liver Oil derivatives. (2) Fish Oils used in Medicine and their constituents. nal preparations of Cod Liver Oil.
**SMITH, THOS. JAS.,** 10 and 11 North Church Side, Hull. iver Oil, Norwegian "Paragon." (2) Cod Liver Oil, ditto. (3) Cod Liver Oil, ht Brown. (4) Cod Liver Oil, Newfoundland. (5) Cod Liver Oil, Scotch. iver Oil, Yorkshire Coast.
**HENRY, JAMES HAY,** Pharmaceutical Chemist, Macduff, N.B. of Scotch, Norwegian and Japanese Cod Liver Oil, Skate Liver Oil, and Ling Liver dicinal use.
**CORMACK, THOS., & SONS,** Cod Liver Oil Manufacturers, Eye- edical Cod Liver Oil in Show Case.
**LINTON, RALPH TAIT,** Pharmaceutical and Manufacturing Edinburgh and Leith. Office: 8, Nicolson Street, Edinburgh. (1) Medicinal Cod- various kinds. (2) Cod Liver Oil Emulsions.
**CARR, W. G. & SONS,** Berwick-on-Tweed. Cod Liver Oil in case. *reade.*]
**McCOMBIE, JAMES, & CO.,** Herring Merchants, and Fish- terhead, Scotland. Cod Liver Oil, viz.:—Medicinal Oil, Currier's Oil.
**CARR, WILLIAM GRAHAM, AND SON,** 613 High Street. n-Tweed. Oils from the Livers of Cod, Haddock and Skate from the coasts of Scotland, Norway and Newfoundland. Cod Liver Oil Emulsion, Cod Liver Oil Cod Liver Oil with Extract of Malt.

**SHOES WITH RUBBER SOLES**
FOR
*AWN TENNIS, BOATING, YACHTING, and GYMNASTICS.*
**ANDERSON, ABBOTT, & ANDERSON,**
37, QUEEN VICTORIA STREET, LONDON, E.C.

DIVISION XXVIII.—[*Corridor to Fish Market.*] *See Plan, p. 70.*

**Antiseptics suitable for preserving fish for food.**

648. **RENSHAW, JAMES,** Northwich, Cheshire. (1) Fishery Salt, Extra Rough. (2) Fishery Salt, Extra Rough. (3) Fishery Salt, Best Scotch. (4) Salt, Seconds. (5) Common Salt. (6) Middle Grain Salt. (7) Table Salt. (8) of Bay Salt. (9) Specimens of Rock Salt.

649. **CORBETT, JOHN,** M.P., Stoke Works, Worcestershire. of Salt for Fish Curing. (2) Natural Brine. (3) Samples of Salt for Provision Household and General Purposes.

650. **DROITWICH SALT CO., Limited,** 8 and 9 Lower Thames London, E.C. (1) Samples of Salt for fish curing. (2) Broad Salt for Fish Curing or coarse). (3) Table Salt, Kitchen Salt, Dairy Salt, Fine Salt (in blocks). Bay crystals), Fine Salt (broken for export). Brine (from which the salt is produced.

651. **BUMSTED, D., & CO.,** 36 King William Street, London Various kinds of Salt suitable for preserving fish for food.

652. **YEOMANS, MATTHEWS, & CO.,** Wincham, Northwich (Fishery).

653. **SANITAS COMPANY, Limited,** Three Colts Lane, Bethnal London, E. (1) Sanitas Antiseptic and Disinfecting fluid; an aqueous Solution of of Hydrogen and other substances for preserving fish &c. (2) Sanitas Antiseptic fecting oil: an oxidized turpentine for preserving fish, &c. (3) Samples of Fish pre the Sanitas preparations.

654. **ANTITROPIC COMPANY;—W. F. GRIER & CO.,** Gl and 20 Stamford Street, Blackfriars, London, S.E. (1) Glacialine, for Household preserve fish in a sound and fresh condition for a few days in the hottest weather. a portable form, very convenient for the household, in packets, boxes, and canisters. Antitropic Fish Preservative (put up only in casks of a hundredweight and up preserving fish at the place of capture, so that they may be transmitted in a sound without ice to distant markets. (3) Specimens of Fish preserved by above (5) Microscopic Specimens of interest to Pisciculturists. (Removed into west T Block.)

654a. **KING, WILLIAM,** 1 New Road, Commercial Road, London. Preservative.

DIVISION XXIX.—[*West Gallery.*] *See Plan, p. 76.*

(*b*) For other than edible purposes—
Oils, manures, and other products prepared from fish.

655. **CARR, WILLIAM GRAHAM, & SON,** 63 High Street, on Tweed. (1) Stearine used for making candles from the Deposit of Cod Liver Oil for dressing leather. (2) Oil-cake for feeding Cattle from the refuse of Cod Liver and Liquid Manures from the refuse of the above oils.

656. **LAUGHRIN, WILLIAM,** Polperro, Cornwall. Oils, ½-pint Samples showing how much Oil can be produced from certain weights of liver in fish:—Torpedo Ray, Ling, Skate.

657. **BLUNDELL, SPENCE, & CO., Limited,** 9 Upper Thames London, and Hull. (1) Cod and Whale Oils for tanning and leather dressing. Seal, and Shark Oils for burning. (3) Sperm Oil for machinery and soap-making poise, Herring, Sardine, and Train Oils.

658. **DALES, JOHN T.,** 287 Crystal Palace Road, London, S.E. Porpoise Oil Dubbin for waterproofing, preserving and softening boots, harness goods; also useful as a kid reviver. Rats or mice will not touch leather dubbin is used.

GRIMBLE & CO.'S VINEGAR,
(Gold Medal, New Zealand, 1882)
PURE WHITE, BROWN, AND STRAW-COLOURED,
FOR FISH-CURERS, PICKLERS, & TABLE PURPOSES.
PRICES AND TERMS ON APPLICATION.
CUMBERLAND MARKET, LONDON, N.W.

**9. LINTON, RALPH TAIT,** Pharmaceutical and Manufacturing st, 8 Nicolson Street, Edinburgh. (1) Spermaceti and preparations. (2) Sperm Oil hale Oil. (3) Kelp, Iodine, and Iodide of Potassium.

**0. SINCLAIR, WILLIAM,** Drumbeg, Donegal. Collection of Oils ted from livers of different varieties of Dogfish and specimens of the fish in different of preparation for manure.

**0a. ANGLO-SWEDISH COMPANY, Limited,** 23 Old Change, E.C. d Guano products of Fish, from the Company's works at Grötö Lyseki, Sweden.

**0b. SULLIVAN, A.,** Newlyn West, Cornwall. (1) Pilchard Oil crude. itto refined.

DIVISION XXXI.

**Sea and fresh water pearl shells; mother of pearl manufactured; pearls sorted.**

**0c. LEE, HENRY,** Margate. (1) Shells of Pearl Oyster. (2) Spat of Oyster. (3) Shells of Pearl Mussels. (4) Oyster and Mussel Pearls.

DIVISION XXXII.—[*West Gallery.*] *See Plan, p.* 76.

**eparation and application of sponges, corals, pearls, shells, all parts and products of aquatic animals, &c., to purposes ul and ornamental, with specimens.**

**1. ABRAHAMS, ARTHUR,** Crystal Palace, Sydenham, S.E. (1) Col- of Rare Shells. (2) Shells manufactured for useful and ornamental purposes, with pecimens. (3) Useful Articles manufactured from mother of pearl, and Pearl Shell ments. (4) Specimens of Coral.

**2. BIGLIOSCHI, V.,** 101 Ledbury Road, Bayswater, W., London. ollection of Pearls, Shells, Manufactured Imitation of Pearls, Shells, Corals, &c. (2) arranged and mounted as pictures.

**3. JARDINE, MRS. ALFRED,** 18 Albion Square, Dalston. Corals, and Algæ.

**4. MAPPIN, BROTHERS,** 220 & 222 Regent Street, W., and London e, E.C. (1) Pearl Shells in their rough state. (2) Pearls in various stages of manu- e for knife handles. (3) Pearl-handled Table Knives. (4) Fish Carvers. (5) Dessert s. (6) Razors. (7) Pocket Knives. (8) Tortoiseshell Razors. (9) Pen Knives. Purses. (11) Card and Cigarette Cases. (12) Sardine Boxes and Tongs. (13) r Crackers and Pickers. (14) Crocodile Skin Travelling Bags. (15) Dressing Cases. Purses. (17) Cigar and Cigarette Cases. (18) Whales' Teeth. (19) Sea-horse Teeth.

**5. GRECK & CO.,** 9 Rathbone Place, Oxford Street, W. Coral, lery, Necklaces, Brooches, Cameos, Lentils, Beads, &c.

**6. SAMUEL, M., & CO.,** 31 Houndsditch, London, E.C. (1) Shell and Cushions. (2) Shell Collars and Bracelets. (3) Engraved and Painted Shells. Suspended Shells for Flowers. (5) Flowers made of Shells. (6) Lobster-men. (7) r Stands. (8) Purses and Shell Jewellery. (9) Shell Men. (10) Pearl Shells (rough). Pearl Shells (clean). (12) Mother of Pearl manufactured. (13) An Entire Suite of oir Furniture in Mother of Pearl.

**7. BOROUGH LEATHER WAREHOUSE COMPANY,** 134 High t, Southwark, London, S.E. (1) Entire Skin of Alligator, mounted and stuffed, &c. Entire skin of Alligator, mounted and stuffed, &c., smaller. (3) Prepared Alligator s, tanned and dressed; various colors. (4) Saddles, Boots, Slippers, Dressing-bags, s, Cigar Cases, Cigarette Cases, Fusee Cases, and other articles, all of Alligator's Skin, ing its application to purposes of commerce. (5) Various further articles, Penholders, Frames, Purses, Card Cases, &c., all of Alligator's Skin. (6) Albums and Books bound ligator's Skin. (7) Prepared and Dyed Pearly Back Ray-fish Skins. (8) Cabinet,

**The Best and Cheapest.** **First Established 1825.**

**NEAVE'S FOOD** FOR **INFANTS** AND **INVALIDS.**

IN ONE-POUND ONE SHILLING CANISTERS.

*SOLD EVERYWHERE.* *WHOLESALE OF THE MANUFACTURERS,*

***J. R. NEAVE & Co., Fordingbridge, England.***

outside mounted with Ray-fish Skin (pale grey colour, inlaid in Argenton or Inoxidisable Metal with Ebony—unique and extraordinary piece of furniture. Chair of same material. Mirror ditto; showing application of Ray-fish Skin to articles of decorative art. (9) Two Ladies' Work Tables of Inlaid Ray-fish Skin—same colour, mounted with engraved Argenton or Inoxidisable Metal. Two Jardinières of same material, one inlaid in Ebony, and one inlaid in Ebony. (10) Sets of minor articles, such as Glove Boxes, Cigar Boxes, Cigar Cases of same material, in silver or metal mounts. (11) Specimens of Tanned, Prepared and Finished Serpent Skins (Boa Constrictor and Python), &c. (12) Sets of articles made from Serpent Skin, Blotting Cases, Ladies' Belts, Purses, Pocket Books, and various leather work of Serpent Skins; showing their application to articles of utility.

**668. JACQUES, JOHN,** Royal Aquarium, Westminster, London. (1) Samples of Coral and Shell Ornaments. (2) Sets of Ornaments manufactured out of Pearl. (3) A variety of Shell Ornaments. (4) Fish Scale Ornaments. (5) Venetian Shell Ornaments.

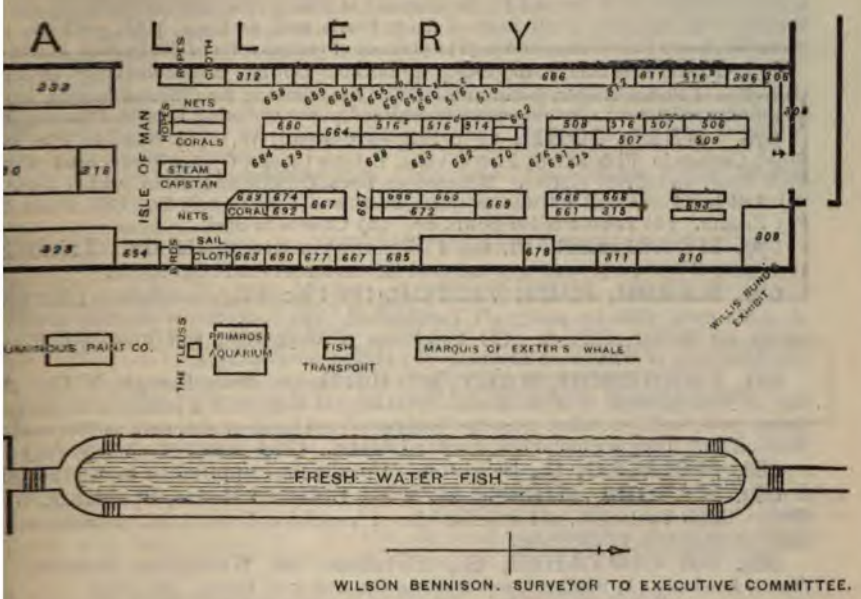
**668*a*. PHILLIPS, BROTHERS, AND SON,** 23 Cockspur Street, London. Corals, Pearls, &c., and pearls as applied to reproductions of the Cinque Cento and Renaissance periods. Also models of fishes in fine gold and enamels.

**669. DAVIS, A. A.,** 46 Buckingham Road, Southgate Road, London, N. (1) Specimen of Corals, Pearls, Shells, Conger Shells, Clam, Cabinet Shells, in Ornamental Works and Manufactured State. (2) Glue or Cement prepared from Gelatine, Fish Isinglass, Raw Isinglass, Leaf and Manufactured State.

**670. VOTIERI, JOHN,** 315 Camden Road, Holloway. Collection of Shell Cameos, made of a variety of Shells, Engraved Shells, and Corals, &c.

**671. WARD, ROWLAND, & Co.,** Naturalists, 166 Piccadilly. Special inventions and adaptations of LOBSTER and OYSTER SHELLS for all Table purposes, mounted in

**Ye Spider and ye Fly Brooch, 5s. 6d.**
LATEST FROM PARIS, CATSEYE AND REAL PEARL JEWELLERY.
STAG BEETLES, BUTTERFLIES, FROGS, AND LITTLE DUCK BROOCHES.
**NEW DIAMONDS, SPANISH CRYSTALS, RINGS SET IN GOLD, 10s. 6d.**
Earrings, Bangles, Studs, Pins, Necklets.
**MORRELL'S, JEWELLER,**
**60, 61, 42, BURLINGTON ARCADE, PICCADILLY, W.**




WILSON BENNISON. SURVEYOR TO EXECUTIVE COMMITTEE.

other metals. Registered designs. (2) Fish, in action. (3) Studies in entirely ns, invented by Rowland Ward, F.Z.S. The real skins mounted. (4) Fish Skin, eads, Sharks' Jaws, Whales' Vertebrae, Teeth, Crocodile Hide and Teeth, Turtle oise Shells, &c., &c., utilized in original designs by Rowland Ward, F.Z.S. (5) Two taining Aquatic and other Birds collected by Sir Thomas Hesketh, Bart.

**KING, W.**, 30 Hardwick Street, Dublin. Collection of Rough Sea d Shell Work.

**GIOBERTINI & CO.**, Paris and Naples. A Collection of Pearls s.

**BARKER, JOHN, & CO.**, High Street, Kensington, W. Sponges, Shell, and Mother-o'-Pearl Fans, &c.

**CRESSWELL, R., & CO.**, Red Lion Square, London. Sponges, &c.

**RUFFO, W.**, 142 Hampstead Road, London, N.W. (1) 6 Coral Sets d. (2) 12 half Coral Sets completed. (3) 12 Pairs Coral Earrings. (4) 24 Coral n's Pins. (5) 12 Pieces Coral Hair Ornaments. (6) 24 Coral Sets, Studs and Cuffs. ction of small Utensils of Manufacture. Models made on purpose to show how ure is done with rough material in different stages of manufacture. (8) 4 Tortoise-nsol handles. (9) 36 Tortoiseshell Sets Re-sorted. (10) 6 Tortoiseshell Bracelets. Tortoiseshell Hair Ornaments. (12) 4 Dozen Coral and Tortoiseshell Charms.

**LAMB, MRS. C. S.**, 76 Clifton Hill, St. John's Wood, N.W. Collection ents made from fish scales. (West Indies) Consisting of Tiara Spray Brooch and Earrings.

**OULMAN, FILS, & CIE.**, 8 Rue Drouot, Paris; 1 Ely Place, Lon-porters of Oriental Pearls. (1) A very choice 5-rows Necklace of 355 Pearls, 2570 grains. Oriental Pearls. (2) A matchless Necklace and Parure of Scotch Pearls, unique. (3)

LADIES' LEVE ANTIPLUVIUM CAPES.

**For the Pocket. Only 10 ozs. in Weight.**

**DERSON, ABBOTT, AND ANDERSON,**

a-Rubber Manufacturers, 37, Queen Victoria Street, London, E.C.

A very important Black Pearl Necklace, composed of 39 Pearls = 1020 grains. (4) One [illegible] Pearl of 96 grains, being one of the finest Pearls known, and worth £20 per grain. (5) A [illegible] important collection of Oriental Pearls composed of 3345 grains; original, such as are [illegible] Bombay. (6) Samples of all kind of fancy Pearls, such as black, pink, yellow, grey; [illegible] Australia, South Pacific Islands, &c. (7) Specimen of various sorts of Shells and Panama [illegible]

677. **MARKWALD & CO.**, 2 Talbot Court, Gracechurch Street, [illegible] Collection of Rough Amber, found in the Baltic Sea, showing the different kinds, colours, [illegible] qualities in existence; also curious specimens and pieces enclosing Insects, Plants, Wood [illegible]

678. **NEAL, JOHN**, 44–8 Edgware Road, W. (1) Neal's Patent [illegible] Silver Cutlery in Fish Eaters, Fish Carvers, Lobster Cracks, Oyster Forks, and Combi[illegible] Fish Meat, and Fruit Knives. Mounted in Rock Coralite and Pearl and Ivory [illegible] (2) Articles of ornament and use in Coral, Pearl, and Tortoiseshell, &c. (3) Fish [illegible] Soy Frames. (4) Lobster Salad Bowls, &c. (5) Cameos in Shell.

679. **MORTIMER, M. A.**, 1 Blessington Street, Dublin. Irish Shells [illegible] their natural state, and some manufactured into ornaments and other shells.

680. **MARSH, JOHN VICTOR**, 175 Piccadilly, London. (1) Collection of goods made with (or partly of) Tortoiseshell. (2) Collection of articles made with (or partly of) Mother of Pearl. (3) Specimens of Unprepared and Prepared Cuttle [illegible] (4) Specimens of Whalebone Brushes. (5) Collection of Sponges.

681. **FERGUSON, MARY**, Mill Hill House, Musselburgh, N.B. A Collection of Flowers made of Fish Bones. This exhibit consists of a variety of flowers, [illegible] bones, teeth, and eyes, taken from the heads of several kinds of fish, such as the cod, [illegible] herring, &c. They are imitations of natural flowers. (Five years in manufacture.)

682. **MELILLO, G.**, Brighton. Corals, &c., applied to manufacture.

683. **MAPLES, MISSES H. & E.**, Elmsford House, Spalding. [illegible] Screen, Small Tablecloth, and other articles of a useful and ornamental character [illegible] cloth or satin with fishes' scales.

684. **DE GIOVANNI, G.**, Cavaliere, 38 Wellington Street, [illegible] Town, London. (1) Shell cut, representing the Toilet of Venus. (2) Shell cut, [illegible] Amphitrite. (3) Corals. (4) Cameo Portrait of the Right Hon. W. E. Gladstone, [illegible] taken from life. (5) Cameo Portrait of the late Doctor Billing—from life.

685. **MAPPIN & WEBB**, Norfolk Street, Sheffield. London [illegible] Mansion House Buildings, City, and Oxford Street, W. (1) The application of [illegible] Pearl and Tortoiseshell, to Table Cutlery, Pocket Knives, Necéssaires, Fish Knives, [illegible] Stands. (2) Crocodile Skins and Shark Skins manufactured into Spirit Stands, [illegible] Bags, Razor Cases, Etuis, &c. (3) Fish Baskets. (4) Angler's Dressing Bag, [illegible] Cowhide, Gladstone, silver and ivory fittings, and every requisite for fishing—[illegible] landing net, &c., and room for a suit of clothes.

686. **DAVIDSON, JOHN**, Jeweller, Wick, N.B. A collection [illegible] Brooches, Earrings, Lockets, Bracelets. Scarf Pins, Rings, Studs, and Necklets, [illegible] Shells from "John o' Groats," set in silver and gold.

687. **GOLDSMITHS' AND SILVERSMITHS' COMPANY**, [illegible] Regent Street, London, W. (1) Choice Oriental Pearls of various colours, [illegible] unmounted. (2) Shells showing the formation of the pearl in the oyster. (3) Coral [illegible] in their natural state. (4) Coral as applied to the industries and arts.

687*a*. **TROTMAN, SAMUEL**, 55 Lillie Road, Fulham, S.W. (1) [illegible] applied to ornament mirrors and caskets. (2) Groups of Crab and Crayfish made [illegible] castings in bronze, terra cotta, and majolica.

688. **MARSHALL, JOHN**, 92 Peckham Park Road, London, S.E. [illegible] Cement (prepared from Isinglass) for repair of Aquaria, Fishing appliances, and the [illegible] vation of aquatic specimens.

689. **DAVIS, STEPHEN**, 50 Fann Street, Aldersgate Street, E.C. [illegible] mens of Shells manufactured and in natural state; also Sea Ivories, Horns, [illegible] manufactured and rough.

**OROIDE GOLD JEWELLERY**

**(REGISTERED).—THE PERFECT SUBSTITUTE FOR GOLD**

**WATCHES**, in elegant designs, equal in beauty and utility to 18-carat, 31s., 35s., [illegible] Self-winding, 42s. Warranted accurate timekeepers.

**LOCKETS**, to hold two portraits, set with pearls, coral, &c., highly finished, 2s. 6d. to [illegible]

**ALBERT** and other **CHAINS**, fine gold patterns, 5s., 7s. 6d., 10s. 6d. Studs, Links, [illegible] 2s. 6d. Scarf Pins, 1s., 2s., 2s. 6d. Every article of jewellery safe and free per post.

*Opinions of the Press and Illustrated Price Lists (New Edition) free.*

**C. C. ROWE**, 92, BROMPTON ROAD, LONDON S.W. (Established 1870.)

Within Five Minutes' Walk of the Fisheries Exhibition.

. **SMALL, J. W.** (1) Hand Painted Tiles (Fish Designs).

. **BRASSEY, LADY,** Normanhurst Court, Battle. (1) Unique Neck- twenty-five very large Coral Beads (Corallum rubrum), weight 5 oz. 18 dwts. (2) ce of thirty-five Beads, weighing 3 oz. 5 dwts. (3) Pair of Bracelets, consisting of ws of fifty-eight Beads, with large Coral Clasp mounted with Diamonds. (4) Cross, ng of large disc of Coral in centre, surrounded by eight pear-shaped Corals, the whole d with Diamonds; 2 oz. 16 dwts. (5) Two Brooches of very large pieces of Coral, ded by Diamonds. (6) Pair of round Coral Earrings, girdled with bands of Diamonds. ronet or Head-dress of Coral.

. **DE JACOBIS, RINALDO,** 215 St. John Street, Clerkenwell, , E.C. (1) Shell Cameos of all sorts; also Ornamental Shells. (2) Coral in rough nd manufactured.

. **FRANCATI AND SANTAMARIA,** 65 Hatton Garden, London. ells and Corals, rough and in course of manufacture. (2) Suites of Shell and Coral nts and jewellery. (3) Shell Mosaics, set in jet, cameos, &c. (4) Cut Shell. (5) d of working, illustrated by English workmen.

3*a*. **STANFORD, EDWARD CHARLES,** F.C.S., Dalmuir, Dum- shire. Products from seaweed, including a series specially illustrating Stanford's new d of utilizing it in the production of algin and the manufacture of paper.

3*b*. **GOLDSMITHS' AND SILVERSMITHS' COMPANY,** 112 t Street, W. Collections of Pearls, Corals, &c.

3*c*. **JAMES, HERMANN,** 12 Edward Street, Hampstead Road, N.W. s made from Ivory, Pearl, Coral, Tortoise-shell, Fish Skins, and all kinds of shells.

4. **THOMPSON, HENRY JAMES,** Upper Walmer, Kent. (1) Pair aster Vases, with Shell Flowers and Insects. (2) A Round Shade and Stand, Basket Work, with Shell Flowers, &c. (3) A Round Shade and Basket of Ferns, Flowers, &c. n Oval Shade and Basket with Group of Flowers and Butterflies, all natural shells.

## MACHINERY IN MOTION. *See Plan, p.* 84.

### Machinery in its Application to Fishing.

NERY, in whatever form, is from its very nature and origin indissolubly connected civilisation. Its conception needs years of accumulated thought; its construction es stores of accumulated wealth; and its application demands large fields of accu- ed material. No one, unless he have had long practice in such kind of work, can desire nd an effective instrument for executing the purposes of the simplest handicraft. No an go a single step out of the regular course of trade without becoming involved in ses to which he can foresee no practical limit. No one would dream of incurring the y of time and capital needed for the erection of machinery, unless the store of materials hich it is destined far exceed the amount which could be worked in the same time by . Now these three qualifications alone, accumulated capital, accumulated labour, accu- ted thought, form three main elements in the analysis of material civilisation; but there urther aspect to the question which indicates the need for a still higher degree of culture. introduction of machinery inevitably entails an increased demand, both upon the moral ntellectual qualities in proportion to its own power and complexity. Vigilance, patience, ntrated attention, strict fidelity to orders, combined with latent fertility of resource, e at any moment to be called into action—these and other similar qualities are absolute tials for the machinist, and are developed in him by the mere pursuit of his daily pations. Accordingly the progress made from a material point of view by the various es of the body politic may be to a great extent measured and defined by the ingenuity of uments adapted for the purposes of their industry, as for instance in the bonanza farms of rica, where every kind of agricultural process is accomplished by steam. In this light the ication of machinery to fishing possesses a peculiar interest, for it shows how the barriers enturies are silently giving way, and the character of poverty and simplicity, which for so distinguished this ancient industry, is gradually, not to say rapidly, changing beneath combined influences of wealth and thought.

An inquiry, therefore, of the extent to which machinery now enters into the apparatus of ing is evidently a matter of high interest, both from a commercial and a social point iew. An analysis of this kind can only be properly performed, of course, by an examina- of the particular instances wherein machinery has been successfully applied, and as no favourable opportunity for such an investigation can well be conceived than is afforded

improvement upon Dr. Clarke's process, and the same principle could w
keeping large beds of our rivers,—containing, say, twenty millio
wholly free from chalk and other impurities for the preservation
Another ingenious adaptation of steam to steering is that of the
motion devised by Messrs. Davis, in such a way that the strain, acting
worm, is unable to produce a circular motion, whereby the kick of the
the helmsman and so trying to the gear, is obviated even in the roughes
too of a special character are here required, both for ordinary purposes
in the trawl. In connection with this last point, it may be observed
easily worked invention for raising ships exhibited by Messrs. Thoms
of easy application to raising the trawl for those smacks to which ste
fitted. So, again, to accomplish a large catch is much, but to accomplis
at least equal importance. How shall the immature fry be permitted
question upon which depends the fate of the whole rising generation
of the whole rising generation of fishermen. Mr. Read furnishes us w
The same mesh will be square or lozenge-shaped, according as it is
longitudinally, and while in the former case it will allow any diminut
unharmed, in the latter it will inevitably catch them by the gills, no m
may be. To avoid this misfortune, an untoward event for both partie
keeps the cod of the trawl extended by a couple of hoops, whereby th
into the square, and the young fish are saved from useless and wasteful d
it is urged, the mesh when distended is not strong enough to bear a str
giving more room diagonally than longitudinally, favours the flat fish
which require the greater protection. Hereupon Mr. Morris comes for
mesh of wire which does not yield to the pressure and possesses the
the same space of aperture in every direction. Nor is the application
means confined to the apparatus immediately forming part of a smack'
are needed in various ways, such as the Bisschop Engine, which pumps
the supply tanks of the fishponds at Ringwood in the course of on
Portable forges are in use on board steam trawlers, fitted with sentinel va
warning at a certain temperature call the attention of the fisherman w

of soda instead of oxydised oil, is not liable to glaze under friction. Then, refrigeration is a matter which has taxed the brains of many mechanicians. Provision en made during some years for the storage and manufacture of ice on board our g vessels, but the cold air method is of more recent invention. The dry air rator shown by Messrs. Haslam, in which the air being first condensed in the top r to about 40 lbs. to the square inch and then cooled by the action of water from t, discharges a volume of air amounting to no less than 40,000 cubic feet per hour average temperature of 40° below zero. So many, in fact, are the varieties of apparatus e can scarcely enumerate the objects for which they are designed. If the water shallow at the bar of a harbour, Messrs. Priestman with their steam dredge are at e come to our assistance, while Mr. Thomas presents us with a model of a harbour, so ted as to make the out-going tide completely overpower the incoming one, and with itional assistance of his submarine self-acting dredge sweep away the bar and prevent re-forming. Thus we may hope to apply in a different sense the well-known words of ngsley and "bid good-bye to the bar and its moaning," and to all the loss and sorrow it has occasioned. If on our voyage we are caught in a fog, and in spite of our siren a n becomes imminent, Messrs. Lafargue suggest an hydraulic gear for steering by which gest ship can be instantaneously placed upon any course we may desire. If our vessel ck, and the long boat requires to be launched, the old familiar danger that its crowded s will be poured headlong into the angry waves is obviated by such gear as is shown by nder Mark Robinson, wherein the common hook is combined with a slipping apparatus simple loosing of a rope instantaneously disconnects the couplings fore and aft at the me. If we are so fortunate as to require no such apparatus, but arrive unharmed in chinery meets us once more, and Messrs. Clarke-Brummel's hydraulic lift is put uisition for bringing the fish ashore. Or to take an instance which shows into what details the use of machinery has entered—most persons who have been at sea must be of the action which the saline air is apt to exercise upon metallic articles, and it is no ure of the height to which refinement has now been carried in these matters that a this kind has received the special attention of the Gilding and Silvering Company.

the other hand the electrical devices and the meagreness of the appliances adopted ing life betray the crude and unfinished character of the most elaborately-fitted fishing Yet here, too, is a field which must by no means pass unnoticed. Here are the ous appliances of electricity exhibited by Messrs. Whiting, which, not to speak of their e power of subduing whales and other large fish with no more difficulty than occurs nses, are capable, from the peculiar power they possess of contracting the diaphragm reby causing the great desideratum of artificial respiration, of being applied with ble effect in resuscitating the half-drowned fishermen. Nor must we overlook the machinery shown by Messrs. Shields for calming the troubled sea by means of oil; luminous paint, which shines calmly amid the wildest drenchings of the tempest; asbestos, which preserves a wooden hull intact from the fiercest onslaught of fire and um; or the Messrs. Bapty's invention for establishing communication between light- nd fishing fleets; or Colonel Lambart's raft, which can be thrown overboard in any ; or Messrs. Berthon's compressible and easily stowed lifeboats; or Messrs. Went- Kredemnon life-saving dresses, which scarcely encumber the wearer more than y dress, and yet can defy the utmost power of the waves; or the helm signals, ndicate at the mast-head every motion of the rudder; or even the well-known basket ket apparatus for the conveyance of shipwrecked mariners ashore, which the Board of xhibits daily. No matter connected with these interests can be of greater urgency, rely as a matter of sentiment but also of economy, than the preservation of the valuable gaged in the service. Yet when the members of the Royal Commission held last year ed that cork jackets should be assumed by all persons on board the fishing fleet at a given by the admiral or by the captain of the steam cutter, the proposal was finally ned on account of the reluctance which the witnesses declared would be felt by the en in taking even so simple a precaution against obvious danger. If the present tion has no other effect than that of preserving a single life by removing this childish not unnatural fear of imputed cowardice, it will not have been held in vain.

Yet, numerous and grave as are the deficiencies in these important respects, it is impossi to review even the brief investigation in which we have been engaged without perceiving th in more ways than we can appreciate, the use of machinery is tending to complicate the ima morial simplicity of fishing, and this is a point of the utmost significance to those who have heart the welfare of our fishermen. For if there be one axiom inculcated beyond all othe by the general history of trade, it is that unless the economic keep pace with the mechani machinery, the latter will tend constantly to increase the advantages of capital relatively those of labour. For machinery, as we have seen, involves capital, and capital presupposes th almost insuperable advantage that it can afford to wait. Thus to the decay of the mediæ guilds, those close but strictly co-operative corporations, may be traced no small portion of th convulsions experienced in the industrial world consequent upon the enormous increase commerce during the last and the present centuries; and the strikes and lock-outs, whereby th respective bodies of artisans and proprietors have beaten each other into some acknowledgme of the rights of each, form but an inefficient and unstable substitute for the organisation whi blended the two elements in harmonious growth. Signs are not wanting that a simil atrophy may be setting in with regard to this industry also. The system of apprenticeship which, whether good bad or indifferent, at all events preserved the distinctiveness of th pursuit, is fast becoming extinct. Casuals take the place of seamen for a voyage or two, an then return to their own occupations on shore. Complaints are heard on every side that th owners of vessels experience continual loss through the refusal of the hands to fulfil their legitimate engagements. These are all symptoms that the economical machinery of distribution has not kept pace in development with the mechanical machinery of production; and the very improvements to which we now point in triumph as evidence of increased prosperity may prove, unless accompanied by a corresponding advance in the condition of our fishermen, to be the instruments whereby we may come to lose that hardy and invaluable race for ever.

W. M. Adam.

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694*a*. **DAVEY, PAXMAN & CO.**, Engineers, Colchester. (1) Double Cylinder Horizontal Engine, 350 I.H.P. (2) Horizontal Compound Engine, 200 I.H.P. (3) Three Semi-fixed Engines and Boilers, 25 H.P. nominal. (4) One Semi-portable Engine, 20 H.P. (5) Group of five Locomotive Boilers.

694*b*. **KINGSFORD, COURTNEY.** Lea Chemical Works, Victoria Park, London, E. (1) Model of Kingsford's Patent Steam Boiler and Coke Ovens. By this arrangement the entire cost of fuel required in generating steam is saved. The coke made (which is of good hard quality) is readily sold for a higher sum than that paid for the coals. It has been working more than twelvemonths most satisfactorily.

695. **HALL, J. & E.**, 23 St. Swithin's Lane, E.C., and Dartford Iron Works, Kent. (1) Patent Cold-Air Machine, for preservation of fish on board ship and on shore. (2) Patent Cold-Air Machine for fish stores and shops, worked by gas engine.

696. **BARTON, C. E.**, Providence Works, 56 & 58 Eastgate, Great Grimsby. (1) Six Ice-breaking Machines for hand and steam power. (2) Two Fish Barrows. (3) One Fish Kitt. (4) One Fish Weighing Machine. (5) Two Dogs for moving block ice.

697. **PISTON FREEZING MACHINE AND ICE COMPANY**, 301 and 303 Oxford Street, W. (1) Ash's Patent Self-feeding Dry Air Refrigerators. (2) Ash's Patent Filtering Refrigerator. (3) Ash's Patent Piston Freezing Machine and Wine Cooler.

698. **CLOWES & SONS, Limited**, Duke Street, Stamford Street, S.E. Printing Machinery.

699. **BROOKE, J. W.**, Adrian Iron Works, Lowestoft. (1) One 3-inch Adrian Double Action Pump for ship use, &c. (2) One 4-inch Adrian Double Action Pump for general purposes, especially circulating water in fish ponds; driven with gas engine.


# ANDERSON, ABBOTT, AND ANDERSON,

## INDIA-RUBBER & OILSKIN MANUFACTURERS.

**Works: LIMEHOUSE, LONDON.**

37, Queen Victoria St., **LONDON.** | 9 and 10, High Street, **BRISTOL.** | 16 and 17, Castle Street, **SWANSEA.** | 8, Rue Mariel, **PARIS.**

'00. **GILDING AND SILVERING COMPANY,** 89 Edgware Road, don, W. S. Gorer, Manager. (1) Harpoons, Compasses, Telescopes, Barometers, Fog-rs, Lamps, Clocks, Reels. (2) Process in operation of coating all kinds of Metallic icles used in Fishing or at Sea with Silver, Nickel or Copper, rendering such articles ervious to rust, causing great saving in labour.

'01. **BATEMAN, O. H., & CO., Limited,** East Greenwich, London. am Fittings, Safety Valves, and Gauges, for steam ships; Hydraulic Reversing and ring Gear, Portable Forges, Grindstones, Emery Wheels, Metalized Ship's Blocks, Cranes, other Machinery, working without lubrication.

'01*a*. **TEMPLE, CAPTAIN E.,** 51, Queen Victoria Street. (1) A ghy fitted with Disengaging Gear and Patent Safety Hooks. (2) An Engine Indicator. Anti-fouling Composition for iron Ships' Bottoms.

'02. **HINDLEY, EDWARD,** Bourton, Dorset. (1) Hoisting and Drawing ines and Boilers. (2) 6-Horse Power Steam Engine with rope drawing and lifting gear Boiler. (3) 4-Horse Power Single Cylinder Steam Hoist, with Boiler, on Wheels. (4) orse Power Hoisting Engine on Wheels. (5) Double Cylinder 4-in. Force Pump and gear plete, valves accessible without breaking pipe joints.

'03. **DODMAN, ALFRED,** Highgate Foundry, King's Lynn. (1) tical Engine, for capstans and steam winches. (2) Capstan Engine and Boiler combined. Steam Winch for hauling Nets, &c.

'04. **RUSTON, PROCTER & CO.,** Lincoln. (1) Capstan Engines, with cylinders, strong vertical boiler, gearing, and improved capstan, and pair of fresh-water s; all arranged in position for trawling smack. (2) Capstan Steam Engine, with two nders for hauling up nets; complete with all requisites. (3) One Improved Capstan am Engine suitable for hauling up fishing nets to smack. (4) Improved Capstan Engine, two 5 in. × 8 in. cylinders and strong Vertical Boiler, complete with chimney. (5) Gearing, sisting of Lay-shaft and pedestals, bevel wheel and pinion, vertical shaft bearings and ons. (6) Improved Capstan, with quadruple hand purchase and arrangement for throwing of gear. (7) Pair of Wrought-Iron Side Tanks for holding fresh water to feed the er. (8) One improved Expansive Fixed Engine, with cylinder, 8″ dia. × 16″ stroke. One improved 6″ Centrifugal Pump with foot valve.

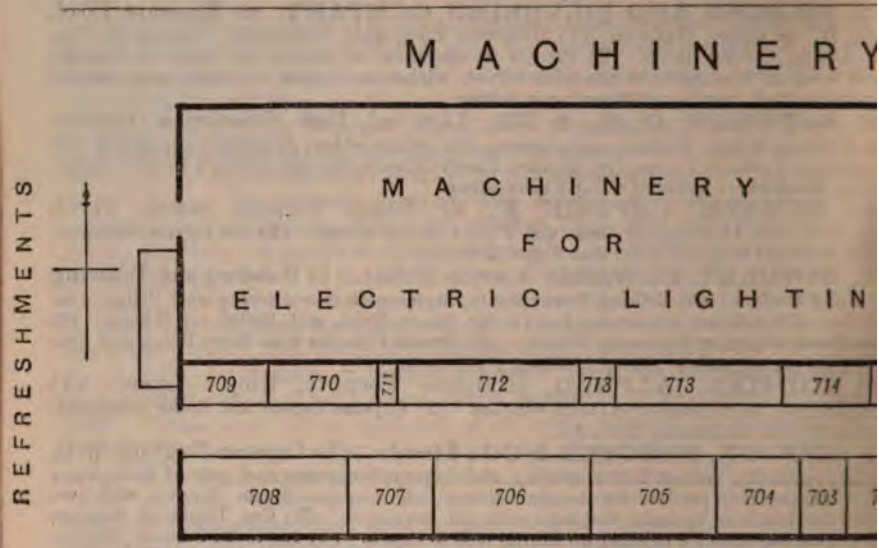
'05. **BELL-COLEMAN REFRIGERATING COMPANY,** 45 t Nile Street, Glasgow. A Gas-driven Refrigerator, for use in fish stores or shops, for erving fish, &c., at low temperature, or for making ice same purpose. The gas engine and igerator are fixed on the same sole-plate.

'06. **RANSOME, ALLEN & CO.,** King's Road, Chelsea. (1) Machines making fish casks, those exhibited being designed for pickle casks of the Scotch type. The comprises: Machine for jointing staves; Machine for jointing and dowalling heading; hine for rounding and bevelling heads; Apparatus for heating casks before being trussed; draulic trussing plant, consisting of three-throw pump (lent to Exhibitors by Messrs. A. ith and Stevens, of Janus Works, Battersea); Trussing machine and accumulator with s and fittings; Machine for chiming, crozing and howelling casks; special automatic hine for grinding cutters; 6 HP. vertical steam engine and boiler, with patent governors, (lent to Exhibitors by Messrs. E. R. & F. Turner, St. Peter's Works, Ipswich.) (2) Col-ion of casks of various kinds made by A. Ransome & Co.'s patent machinery in different s of the world.

'07. **WILLANS & ROBINSON,** Ferry Works, Thames Ditton, rey. (1) Marine Engines, for fishing or carrying vessels. (2) Models and Drawings of am Trawlers and Carriers. (3) Steam Capstans and Winches. (4) Collection of Small rine Compound Engines for fishing vessels (Willans' Patent), with all working parts losed and self-lubricating, and with all bearings in constant thrust, so that the brasses er require setting up. (5) Steam Capstans and Winches. (6) Collection of Samples and dels of Robinson's Patent Boat Disengaging Gear, as used in the Royal Navy.

'08. **VULCAN IRON WORKS COMPANY,** Scott Street, Hull. (1) e large Capstan. (2) Steam Capstan, with Boiler, adapted for use of fresh water only,

**THE BEST FOOD FOR INFANTS**
IS THE ONLY FOOD EXPRESSLY PREPARED FOR INFANTS.
**SUPPLIED TO THE ROYAL NURSERIES.**
**SAVORY AND MOORE.**
143, NEW BOND STREET, LONDON.
*AND OF CHEMISTS, &c., EVERYWHERE.*




carried by boats in tanks. (3) Steam Capstan Engine, with Boiler, adapted for the use of fr or salt water. (Awarded Bronze Medal at Tynemouth Exhibition.) (4) Steam Cap Boiler and Condenser combined, specially adapted for use on board fishing smacks, for provid water for culinary and boiler purposes. New invention. (5) Model of a Steam Traw (6) Photographs, &c., of Marine Engines, Steam Trawlers, Steam Capstans and Fishing gear

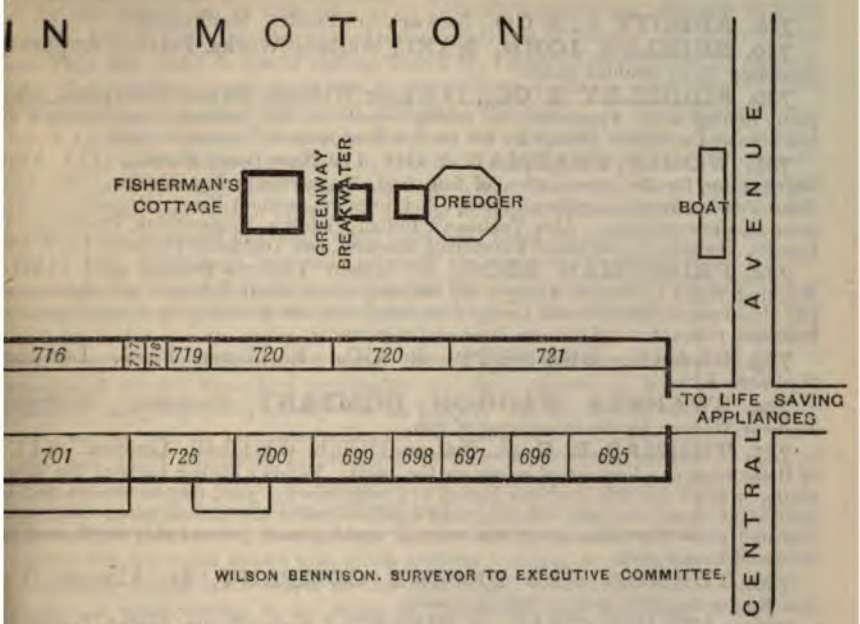
**709. BECK, J., & CO.,** 130 Great Suffolk Street, Southwark, S.E. ( Valves, Pumps, Hose, &c. (2) Fog Horn.

**710. KEYMER, H. J. C.,** The Fisheries' Iron Works, Great Yarmouth (1) Capstan Engines. (3) Hand Capstan. (3) Deck Brush Boring Machine. (4) Mo Steam Fishing Vessel. (5) Model Fishing Boat and Off-shore Boat, fitted with steam. ( Keymer's Patent Combined Steam Engine and Capstan, Horizontal Type. (7) Keymer Patent Combined Steam Engine and Capstan, Vertical Type. (8) Steam Engines a Arrangement for Driving Capstan, Horizontal Type, Old Style. (9) Steam Engines a Arrangement for Driving Capstan, Vertical Type, Old Style. (10) Improved Double Purchase Covered Top Capstan, 3 handles, with Keymer's Ball Bearings. (11) Improved Trib Purchase, Double Speed, Covered Top, 3-Handled Capstan, on Keymer's Patent Ball Bearings (12) New Style Iron Bar Capstan for Steam, on Ball Bearings. (13) Lighter and smaller Covered Top Double Purchase Hand Capstan, on Ball Bearings. (14) Messrs. De Carv and Keymer's Power Saving Patent Differential Hand Capstan. (15) Keymer's Patent 6-Spindle Deck Brush Boring Machine.

**711. JONES, F., & CO.,** Inside Lining of Refrigerators.

**712. ROSE, DOWNS & THOMPSON,** Old Foundry, Hull; and King ston Works, Grimsby. (1) Collection of Steam Machinery, used in Trawl Fishing. ( Kingston Capstan Engine, with two 5-inch cylinders. (3) Kingston Capstan Engine with

WATERPROOF CANVAS
**BAGS, HOLDALLS, AND KNAPSACKS**
of every description for Travellers and Sportsmen.
**ANDERSON, ABBOTT, AND ANDERSON,**
37, Queen Victoria Street, London, E.C.




h cylinders. (4) Kingston Winch for Wire Trawl Warp. (5) Improved Capstan for hand am power. (6) Collection of Improved Appliances for trawling vessels.

12*a*. **DUNCAN BROTHERS**, Engineers, 32 Queen Victoria Street, on, E.C. Tait's Patent Electric Valve Closing Apparatus, for quickly stopping steam es. This apparatus is controlled by hand from any distance by means of electric wires, s also automatic in its action, stopping steam engines almost instantaneously. When ed to marine engines, the officers in charge of the vessel may stop or reverse the engines s time than that in which signals can be transmittted to the engine room.

13. **HASLAM FOUNDRY AND ENGINEERING COMPANY,** ited, Union Foundry, Derby. A Patent Dry Air Refrigerator, to deliver 5000 ft. of air per adapted for fishing smacks, for cooling the fish chambers, also for small fish stores on shore.

13*a*. **UNITED ASBESTOS COMPANY**, 161 Queen Victoria Street, (1) Asbestos Patent Steam Packing for Marine Engines. (2) Asbestos Millboard for and other joints. (3) Fine specimen of Raw Italian Asbestos Fibre as used for making tg. (4) Asbestos Patent Fire-proof Paint for Preserving the Woodwork of Vessels of ds from Destruction by Fire.

14. **DAVIS & CO.**, 24 Moorgate Street, London, E.C. Capstan, Windlass, teering Gear.

15. **CLARK, BUNNETT & CO., Limited,** 4½ Rathbone Place, n, W. Working model of Smith's Patent Hydraulic Dredger.

15. **SIEBE, GORMAN & CO.**, 187 Westminster Bridge Road, London; eptune Works, Mason Street, Lambeth. Patent Universal Cold-Air Machine, for preser- of fish, &c., suitable for small steamers, &c.

17. **MITCHELL & SON**, Kirkcaldy, N.B. Windlasses, for hauling s nets and gear, hoisting masts, &c.

BUNNETT'S PATENT HYDRAULIC HOISTS.
CLARK'S PATENT SELF-GRIPPING CRABS.
SMITH'S PATENT HYDRAULIC DREDGERS.
**CLARK, BUNNETT AND CO., Limited,**
*RATHBONE PLACE, OXFORD STREET, LONDON.*
**Constructors of every description of Corrugated Iron Houses, Constructional Ironwork, &c.**

718. **ABBOTT, J., & CO.**, Newark-on-Trent. Machinery.

719. **SHIELDS, JOHN, & CO.**, Wallace Works, Perth. Appara spreading oil on troubled water.

720. **SIDDELEY & CO.**, 14 Upper William Street, Liverpool. A plete Refrigerating Apparatus, for fishing vessels or fish carriers: comprising a machine and necessary fittings for the hold, to keep same at low temperature.

721. **WOOLF, YEATMAN & CO.**, 119 New Bond Street. (1) A Refrigerator, for the preservation of fish, food, &c., perfectly dry cold air. (2) Y Yeast Powder, for making Bread, Pastry, Puddings, &c., without Yeast. Prepared read oven, in a few minutes. Also Yeatman's Indian Pudding Preparations, Yeatman's Powder, Yeatman's Granulated Flavouring Essences, and Yeatman's Perfected Corn F

722. **PRIESTMAN BROS.**, 52 Queen Victoria Street, and Hul Working Model of Patent Dredger for cleaning rivers, small harbours and fishing (2) Priestman's Patent Steam Dredger, specially adapted for dredging small fishing harbours, rivers, &c. (3) Steam Dredger (in grounds).

723. **CLARK, BUNNETT & CO.**, Rathbone Place, Lond Hydraulic Lift.

724. **SWANSEA WAGGON COMPANY**, Swansea. Refrig Railway Waggon for the conveyance of fish.

725. **THOMAS, E. C. G.**, National Club, Whitehall, London. (1) of Breakwater as a harbour of refuge on the coast. Purely a shelter harbour for us storm, or when low tide prevents ingress to a neighbouring port, may be constructed months, at small cost, and affording any depth of water the largest vessel can req repeated every fifty miles along the coast it would almost prevent shipwreck, and thousand lives a year.

726. **TURNER GAS ENGINE COMPANY**, St. Albans. V Gas Engine for driving steam fishing smacks.

726*a*. **ATKINS, CHAS., & NISBET**, 1 Water Lane, Great Tower E.C. Glutinous Belting Syrup.

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## PREFACE TO CLASS IV.

### Fish-Culture.

Fish-culture in the last quarter of a century has developed aims which remove it from the fish-culture of the past. The object of modern pisciculture is to preserve the of fish life against the disturbing agencies of modern civilization, by affording, close and accurate study, a safe basis for legislative enactments, and by restor already depopulated waters to more than their pristine wealth. Modern fish-culture alike sea and land; ancient fish-culture, with the exception of a few brackish lagoo prised freshwater only. If however Diodorus Siculus is to be trusted, fish-culture 3400 years ago, on a commercial scale which rivals any modern industry, as he men artificial lake constructed by Moeris, where the revenue derived from the fishing talent a day; and the fish increased so fast that the preparations for salting were Passing to China and Japan, fish-culture has long been carried on, but I am not it extends beyond the collection and sale of spawn, and the artificial feeding of although the telescope fish has undoubtedly become a permanent variety through selection. Roman fish culture consisted in constructing stews, more for the gratifica luxury than for increasing the food of the country. In medieval times the institu the monastries again encouraged fish-culture; and it is probable we owe to the grayling and our coregonus, and very likely our pike also; but in their time the necessity for fish-culture had not arisen. The rivers were still unpolluted and the undisturbed. That the bays, estuaries, and sheltered parts of the coast may immediate future be systematically cropped with crabs and lobsters, and with oyster edible molluscæ—that smelts may swarm in our estuaries, and the deep-sea cod be increased—is part of the object of modern pisciculture. In fresh water the important of the culture of the salmonidæ has within the last few years been solved. The disc *Pinchon*, in the fourteenth century, the work of Jacobi in the eighteenth, and agai *observations* of Gehen and Remy in the latter part of the first half of the present *paved the* way for the establishment of Huningue; while M. Veraskie's notebook in the

for ever set at rest all difficulties as to artificial impregnation, although probably ears elapsed before his dry method was adopted out of Russia; and to Mr. George l Page the credit is due of making known M. Veraskie's experiments in America. on that continent may perhaps best be expressed by quoting a letter from Professor Baird, Commissioner of Fish and Fisheries, Washington, to the Commissioner of of Canada. "In the Sacramento River we are absolutely certain of our ground, brought up the supply of salmon to more than its pristine condition of abundance, ting about two millions of young fish every year. The catch there has increased years from five million (5,000,000) pounds to fifteen million (15,000,000) pounds; 1881 there was more fish than could be utilized in all the canning establishments on er." One of the most important points in the study of fish-culture is the selection ost suitable fish for the purpose in view, and the acclimatisation of new species, to be ntly beneficial, requires great knowledge and care. The cultivation of the food of fresh water, and its study in salt, will we hope receive great stimulus from this on. In both branches there is a rich harvest to be gathered. The migrations of ecies of sea fish depending principally—and the quantities of fresh water fish a ace will carry depending entirely—on the feeding. Salmon depend on their spawning r quantity, and on their sea-feeding for size and quality. Oysters frequently thrive en best under conditions unfavourable to their reproduction, hence the kindred of increasing the supply of salmon and of oysters have something in common, and will be largely dependent on artificial culture for their production, and on careful n for their increase and development. Salmon ladders will always continue necessary sport, but the rapid strides with which artificial breeding is advancing will prevent nfficiency telling much longer on our food supply. France, already at the head of lture, is again moving in the matter of pisciculture; and M. Chabot-Karlin, in the du Ministère de l'Agriculture, 1882, reports on the project of forming sixteen chairs of ure throughout France, and in the first bulletin for 1883 he reports that in Belgium rnment has, by the creation of a vast piscicultural establishment, commenced the g of the Meuse Supérieure—that in the grand duchy of Luxemburg the best results in Europe have been obtained—that in Germany success has been obtained l encouragement to private societies, of which that of Metz offers a valuable model—land, by a system of prizes for stocking waters, has produced the best results, and, its concessions of the public domain, has carried oyster culture to the highest point pe. Of the countries not mentioned in the report Norway and Sweden are fully the value of pisciculture; Austria also possesses many establishments. Russia has ren much study to fish-culture: the inspector of fisheries in Finland, Professor n, has just issued an important report. Salmonidæ have been successfully introduced ia, first by Professor Day, and to the Antipodes by Messrs. Francis Francis and Youl. res only the collection and distribution of the knowledge of the world's work in ire—as we hope it will be collected and distributed through this Exhibition—to acre of water more valuable than an acre of land, and the toilers of the sea reap d their present harvest.

J. R. G. MAITLAND.

## AQUARIA.

ot until the Executive Committee of the International Fisheries Exhibition became the immense size which it was rapidly attaining, and of the vast national, not to international importance with which the undertaking had become invested, that of erecting a series of sea and fresh-water aquaria was practically taken into tion. Nor was it after either the first or second anxious discussion that the e felt justified in incurring the large outlay and truly gigantic amount of labour, oretical and practical, which the task of building even a small aquarium under e conditions necessitates. A very little thought will suffice to realize how arduous d were the duties which by such a resolution the Executive Committee under-eir first act was to select a Sub-Committee formed of those gentlemen who were not ently qualified and capable, but also willing to plan and execute the best system the numerous difficulties caused by an unsuitable locality could be most easily l. *The list of this Committee* included the following well-known names, who have

laboured hard since October last to carry out the work which now speaks for
James Ramsay Gibson Maitland, Bart., T. J. Mann, Esq., Col. Stuart Wort
Jardine, Esq., Francis Day, Esq., W. Fell Woods, Esq., Oldham Chambers,
Carrington, Esq., and Henry Lee, Esq.

After the closest inspection of the portions of the gardens available for t
the Committee ultimately decided upon the present position, known generally
Arcade, for several weighty reasons, such as solidity of foundation, existence
concrete roof, and the immunity conferred upon it by its position from the rays
sun, which would have acted seriously on the temperature of the water, while the
spacious cellarage at the southern end afforded the means of procuring a large
the storage of the necessary sea water. Although the period for which it is propo
the Exhibition open for is only six months, yet the Committee have had all
connection with the tanks executed in the best materials, so that there may
chance of those small leaks which have proved such deep sources of trouble in
existing aquarium. In carrying out the work the Committee have had the be
great experience of Mr. H. C. Norman, of the firm of Messrs. Leete, Edwards a
of Euston Road, in conjunction with whom he has superintended the fittin
vulcanite circulation system to the principal existing aquaria. The brickwork i
the best brick fixed in cement, and was set under the personal supervision of
Bennison, who, in connection with the late Major-General Scott, C.B., has mo
carried out the arduous task of erecting the Exhibition buildings. In order
demands of numerous exhibitors, and to enable them to make the Aquarium
representative, the Committee found that it would be necessary to build ninetee
sea and fresh water, and twenty smaller table tanks for sea water alone. As the
of these tanks when merely finished off with asphalte and slate, respectively, ap
Committee to be somewhat unattractive, they determined to face them with ro
found in Mr. Pulham, of Broxbourne, Hertfordshire, a talented and willing con
in spite of the difficulties which are caused by the use of lime in any active form, h
his work with much taste and skill at a merely nominal cost. The water for the sea
has been obtained direct from Brighton, and has been supplied by Messrs. Hub
Pimlico, whose extensive plant, employed for the sea-water supply to the Crystal
Westminster Aquarium, obviates the danger of any impurities being brought i
with the sea-water in transit. The total bulk of water in circulation through th
and twenty small sea-water tanks and reservoirs is upwards of 65,000 gallons, and
was conveyed from Brighton to South Kensington at a fixed rate of 5000 gall
The remaining nine large tanks are fresh-water tanks, and to prevent the fish be
to the variations of quality and temperature of the ordinary West Middlesex Wate
supply, the Committee have availed themselves of the kind offer of Messrs. A
Sanitary Engineers, of 62 Fleet Street, to place at their disposal one of
water-softening and filtering apparatus, which will, as the fresh-water tanks a
with underneath reservoirs, allow of the same water being kept continuously in cir
will of itself prove a great saving in expense, besides benefiting the fish. The
stocking an aquarium being one of great difficulty and also expense, Lord Wale
has presented 1000 freshwater fish of various kinds, the Duke of Bedford se
of carp and other fish, the Marquis of Exeter trout and black bass, the Duke
trout, Sir James G. Maitland trout, and numerous others, have by their generous
very greatly to mitigate the arduous task of the Stocking Committee, who have
use every endeavour to arrange for an adequate amount of seawater fish an
In order to procure an independent supply of the former, the Committee engaged
of a smack-owner to trawl for them in the Channel for three weeks; and as th
of the Brighton Aquarium kindly consented to receive and store the takes of f
spare tanks, so as to give them a break in the voyage from Brighton to the Exh
Committee have been enabled to stock their tanks with, so to speak, partially ed
As regards crustacea, the Committee are indebted to Messrs. Poland Brothers, of B
who have supplied them with a very fine exhibit of lobster, crabs and crayfish; a
Lynn and Gibson, who display an appetising show of shrimps, prawns, and other
Another, and perhaps almost the most attractive, branch of the Aquaria is t

s the anemones, for the finest specimens of which the Committee are again indebted Directors of the Brighton Aquarium, who have given every assistance to procure a gh and handsome collection. It will be well, perhaps, for those visitors who take any t beyond mere curiosity in an aquarium to try and realise for a few moments the gly overwhelming difficulties which appear to crop up on all sides to those who ake the formation of one. So numerous are the questions which have individually to the deepest discussion, that it is quite impossible to consider them in a short preface; may be as well to mention some of the few principal ones. The first question is the y, quality, and direction of the supply of light, which, if not of the most perfect and kind, will entirely prevent the finest aquarium from ever becoming a success. Second importance are the questions of foundation and drainage, as the slightest error in of these causes not only leaks in masonry, but signs the death-warrant of the costly lasses. Next the temperature and quality of the water to be used give a vast amount iety, and when, in spite of all difficulties, the naturalist has erected for himself an um, and the tanks appear to be in the highest degree satisfactory, he has the disappoint- f learning that the light which he has been so assiduously arranging for the benefit public is a deadly enemy to the fish. These are merely the larger troubles, and as ufficient to prove to the visitors' mind the public thanks which are due on all sides to who lend all their science, knowledge, and energy for the public good.

H. W. T.

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DIVISION XXXV.

FISH CULTURE.

**odels or drawings of fish hatching, breeding and rearing blishments, including oyster and other shellfish grounds; and pparatus and implements connected with the same and for porting fish and fish ova. Food for fry.**

DIVISION XXXVI.—[*West Arcade.*] *See Plan, p.* 92.

**esentations illustrative of the development and progressive growth of fish.**

**. RUSS, PERCY H.**, Sligo, Ireland. Oysters.

**. LONDON OYSTER CULTIVATING CO., Limited, THE,** onshire Square, London, E.C. Oysters. Raft for Cultivating Oysters.

**. WOODHOUSE, C. OBINS,** O'Meath, co. Louth. Oysters—Car- d Natives and Naturalized French.

**. WALLSCOURT, LORD,** Ardree-Oranmore, co. Galway. Native s from uncultivated beds at Ardree, Galway Bay, the property of Lord Wallscourt.

**. GRESSY & EZANNO,** Carnac, Morbihan. Oysters.

**. LE ROUX, DR.,** Les Sables d'Olonne, Vendée. Oysters.

**. CORNILLEAU, L.,** La Trinité sur Mer, Morbihan. Oysters.

**. LAMARZELLE DE G.,** Vannes, Morbihan. Oysters.

**. POZZY,** Sarzean Morbihan. Oysters.

**. MARTIN, ALPHONSE,** Kerrgurionne, Morbihan. Oysters.

**. NOUGÉ, HENRI,** Marennes. Oysters.

**. EDAN ET JARDIN,** Auray, Morbihan. Oysters.

**. ATKINS WATER SOFTENING CO.,** 62 Fleet Street, London. atus for removing carbonate of lime from water to prevent incrustation in boilers; and l impurities (sewage and other matters) so injurious to the culture of fish in artificial s, brooks, tanks and aquaria.

ARSON'S PAINT
FOR OUT-DOOR WORK.
BEST AND CHEAPEST.
RICES, PATTERNS, AND TESTIMONIALS POST-FREE.
LONDON, DUBLIN, AND BELFAST.
a Belle Sauvage Yard, Ludgate Hill, E.C.

741. **WHITSTABLE COMPANY OF FREE FISHERS A DREDGERS,** in the County of Kent, known as "*Whitstable C Company*," Thomas G. Browning, Clerk, Whitstable. (1) Samples of Oysters, Living (shown microscopically) and Brood. *Facsimile* of natural Oyster Ground, with boring and other enemies; algæ, sponges, zoophytes, &c. Samples of soil. (2) Collection of Shells. (3) Act of Incorporation, 1793, and Seal of the Company. (4) Collection preserved Zoophytes and Polyzoa found at Whitstable. (5) Collection showing Teredo and its ravages. (4 and 5 lent by Sibert Saunders).

743. **EXETER, THE MARQUIS OF,** Burghley House, Stamford. (W. T. Silk, Pisciculturist to the Marquis of Exeter.) Yearling Trout.

744. **ANDREWS, THOMAS,** Westgate House, Guildford. Yearling Trout.

744*a*. **CAPEL, CHARLES CECIL,** Cray Fishery, Foots Cray, Kent. Yearling Trout.

745. **CHAMBERS, W. OLDHAM,** F.L.S., Lowestoft. Yearling Trout.

746. **THOMAS, J. J., & CO.,** 87 Queen Victoria Street; 285 & Edgware Road, London, W. Galvanized Wire Lattice diamond mesh in roll, used in culture.

748. **CURTIN, FERGUS,** Mucknish Castle, Burren Oranmore, Ireland. (1) An Oyster Lifter, Invented by Exhibitor. (2) Oysters, Red Bank, Burren, Scollops, and other Shellfish.

748*a*. **LEE, HENRY,** Margate. Illustration of Growth of Salmon in Fresh Water.

748*b*. **WALLSCOURT, LORD,** Ardree, Oranmore, co. Galway. Natives (or Native) Oysters from uncultivated beds at Ardree, Galway Bay, the property of Exhibitor.

748*c*. **BRAZIER, ALBERT,** Southwick, Brighton, Sussex. Oysters, natives, seconds, and some oysters cultivated and fattened in the River Adus.

DIVISION XXXVII.—[*West Arcade.*] *See Plan, p.* 92.

## Models and drawings of fish passes and fish ladders. Scientific investigations.

749. **CAIL, RICHARD,** Newcastle-on-Tyne. Cail's Lock Swing Salmon Pass. This system of pass enables the heaviest spawn-laden salmon to surmount obstacle in rivers, such as natural falls, dams, or weirs of any height, even to 100 feet, by swimming through it in unbroken water from the lower to the upper water, without fatigue, exposure, or having to leap. The quantity of water to work this pass is automatic acting, and regulated exactly to suit itself to any height of the water in the river in time of floods. The velocity of the water does not increase as it descends, and in each lock it is quiescent and purls about, imposing no exertion on the fish, and as fish and water are of the same specific gravity, they can ascend 100 ft. easier than a man can ascend the same height by steps.

749*a*. **O'KEEFE, M. T.,** M.I.C.E.I. Model of High and Low Water Fish Pass. Executed in concrete on the River Lee, co. Cork, Ireland.

750. **EXETER, THE MARQUIS OF,** Burghley House, Stamford. (Models and Apparatus by W. T. Silk, Pisciculturist to the Marquis of Exeter.) Model of Fish Breeding and Rearing Establishment. (2) Apparatus for Hatching Salmon. (3) Apparatus for Rearing Salmonidæ. (4) Apparatus used in transporting Fish from U.S. America, with Pump. (5) Tank for conveying Young of Salmonidæ to distances, with Electric Pump attached. (6) Apparatus for carrying Ova of Salmonidæ. (7) Hatching Apparatus for Cod, Soles, Turbot, Herring, &c. (8) Hatching Apparatus for Pike, Roach, Perch, and Tench. (9) Two Salmon Ladders, One Jumping Ladder, One Swimming Ladder. (10) Food for Fry. (11) Model of Fish Hatching. (12) Fish Ladder. (13) Movable trap for catching Salmonidæ.

ALL THE LATEST IMPROVEMENTS IN

**FISHERMEN'S WATERPROOFS,**

TO BE HAD AT

**ANDERSON, ABBOTT, & ANDERSONS,**

**37, QUEEN VICTORIA ST., LONDON, E.**

WORKS—LIMEHOUSE, E.

# THE EQUITABLE LIFE ASSURANCE SOCIETY

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The Pioneer American Company in Europe, and the **ORIGINATOR** of the **TONTINE SAVINGS FUND POLICIES.**

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*By which is secured an Assurance, an Investment, and an Annuity combined.*

The profits divided on this class of Policies at fixed periods have been largely in excess of the bonuses paid on ordinary Life Policies.

*The following are noticeable points in the Twenty-third Annual Report for the Year ending December* 31, 1882:—

| | |
|---|---|
| The Assets exceed ... ... ... ... | £10,000,000 |
| The Surplus exceeds ... ... ... ... | £2,199,000 |
| The Income in 1882 exceeded ... ... | £2,400,000 |
| The New Business in 1882 exceeded ... | £12,900,000 |

Total amount of New Assurance written during the past Sixteen years is larger than that transacted by any other Company. Over £14,000,000 have been paid to Policy-holders in Twenty-three years.

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THE

# WATERPROOF "K" BOOT.

**ANHYDROUS.**

Made of leather prepared by the process approved by the Admiralty for the Arctic Expedition.

Dry, Warm, and Comfortable in Wear.

**27/- per Pair.**

I can strongly recommend the "K" boot, which is advertised in "The Field." I have had a pair a month in all sorts of slush, and find them thoroughly waterproof, and most comfortable to walk in; they are about half the price a first-class London maker charges and quite as good.—S. R. Berwick-on-Tweed.—*Field, Dec.* 11*th*, 1880.

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BISHOP AUCKLAND.—H. Longstaff, (and all branches).
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CHELTENHAM.—W. Sharpe & Son, 11, Colonnade.
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DARLINGTON.—R. Watson, 3, Prebend Row.
DERBY.—James Allsby, 31, Sadlergate.
DUBLIN.—Arthur Webb, 34, Upper Sackville St.
DUMFRIES.—John McClure, 5, English St.
EDINBURGH.—James Allan & Son, 123, Prince's St.
ETON.—Paine & Son, 136, High St.
GLASGOW.—Peter Dickson, 406, Parliamentary Rd.
HULL.—Garton & Atkinson, 36, Whitefriargate.
LEAMINGTON.—Joseph T. Southorn, 112, The Parade.
LINCOLN.—William Andrews, 4, Guildhall St.
LIVERPOOL.—T. K. Fleming, 8, Bassett St.
LONDON.—Marshall & Willats, 476 & 478, Oxford St. W.
" —John Hand, 82, Cheapside, E.C.
" —A. Wilson & Son, 79, Newington Causeway.
MALVERN.—Benjamin Jones, Belle Vue Terrace.
MANCHESTER.—R. Phillips & Son, 75, Deansgate.
NEWCASTLE-ON TYNE.—Amos Atkinson, 70, Grey St.
NEWCASTLE, (Staffs.)—James Leech, 9, Penkhull St.
NEWPORT, (Mon.)—D. E. Davies, 26a, High St.
NOTTINGHAM.—Thos. W. Robinson, 2, Long Row.
OXFORD—Lillingston's, 48, Cornmarket St.
SALISBURY.—J. D. Courtenay, 17, High St.
SHEFFIELD.—Greaves & Son, 157, West St.
SHREWSBURY.—Jos. Della Porta, Princess St.
SITTINGBOURNE.—William Bartlett, 62, High St.
STOCKTON-ON-TEES.—C. Palmer, 162, High St.

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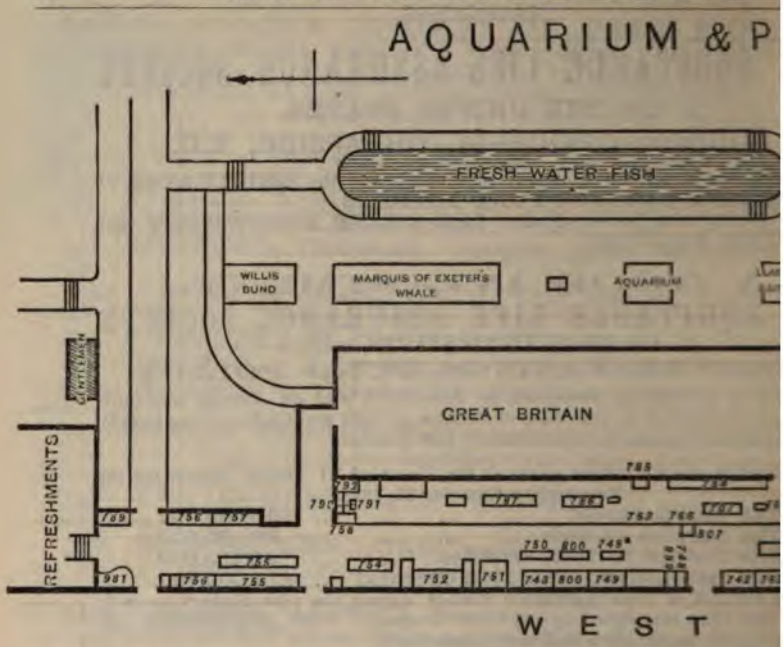



**751. PORTLAND, HIS GRACE THE DUKE OF**, Well
Worksop. Address all communications to Mr. Boaler, Welbeck, Worksop.
Fish Hatching House and Appliances for ditto. (2) Model Fish Ladder and

**751*a*. STUART-WORTLEY, COL.**, Rosslyn House, Grov
St. John's Wood and Patent Museum, South Kensington. Model of Marine
of Circulation and Filtering of water as arranged by the Exhibitor in his priv

**752. CHAMBERS, W. OLDHAM**, F.L.S., Lowestoft. (1
Plan of Fish Culture Establishment, for 100,000 Salmonidæ, combining
Economy. (2) Model and Plan of Fish Culture Establishment, for 300,000 S
bining Efficiency with Economy. (3) Model of a series of Fish Ponds for Fre
In this and the two previous models every pond is entirely independent of the
entire control and management. (4) Description of the way in which Fish Po
structed, and guidance for their management. (5) Hatching Apparatus for S
Hatching Apparatus for Salmonidæ, smaller size. (7) Hatching Apparatus f
(8) Vase for Hatching deep-sea floating Eggs, such as the Cod. (9) Box for
sea adhesive Eggs, such as the Herring. (10) Specimens of Foreign Food Fi
acclimatization into Great Britain. (11) Vase for Rearing Salmonidæ Fry.
Rearing Salmonidæ Fry, on pedestal. (13) Specimens of young Trout in
progressive growth.

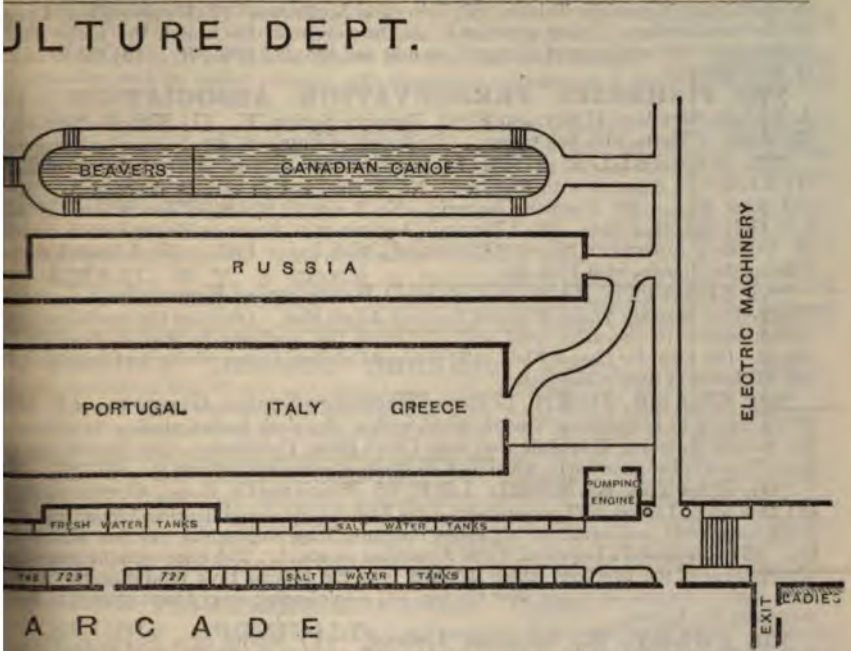
**753. NORFOLK AND SUFFOLK FISH ACCLIMA**
**SOCIETY**, W. Oldham Chambers, F.L.S., Honorary Secretary
Specimens of twenty-five yearling Trout.

**754. STUART & CO.**, 8 Thomas Street, Edinburgh. (1) F
lithic Model of Salmon Pass or Ladder at Morphie, on the North Esk, Forfar

**SHAVING A PLEASURE.**

EDWARD SMITH'S 1s. HOLLOW-GROUND RAZOR is pronounced by all to be
wonderful Razor ever introduced. It has stood the test of over three years, during which
sands have been sold, retail only, at No. 3, Cheapside. It never requires grinding or
complete in case for 1s. 1d.; post free, 1s. 3d. My graduating RAZOR STROP is the best
razors ever introduced. By means of a screw, it graduates its elasticity, making it more or
at pleasure. Its elasticity will prove invaluable to the unskilful operator, as it will
cautiously bearing too hard upon the razor, and injuring its edge, at the same time
keep his razor in perfect order. Price 2s. 9d. and 3s. 9d., post free. Extra best quality,
case and superior finish, 4s. 9d. and 5s. 9d., post free. The Diamond Razor Strop Paste,
The Magic Shaving Stick, 7d., post free. List of Shaving Tackle, post free.

EDWARD SMITH, Razor Maker, 3, Cheapside, London, E.C.




inches; breadth at top, 5 feet, gradually widening out until it is nearly twice that bottom; length of pass, 70 feet; scale, ⅜ inch to 1 foot. (2) Patent Granolithic Salmon Ladder at Deanston, on the Teith, Perthshire. Length of salmon ladder, gradient 1 in 27; width of ladder at bottom, 40 feet; height of side wall at top, 4 ight of side wall at bottom, 12½ feet; cross beams 1 foot deep and 12 feet apart the three upper spaces, which are respectively 8, 9, and 10 feet apart.) Total width of ill, 248 feet. Scale ⅜ inch to 1 foot.

**MAITLAND, SIR JAMES RAMSAY-GIBSON-, BART.**, of . (1) Model of Salmon Hatching House at Howietoun. (2) Model of Piscicultural ment at Howietoun. (3) Implements and Utensils used therein, viz., hatching and trays, cases for transport and export of ova, tanks for carrying Trout and Fry with e aeration of the water, "feeding spoons," grilles, ova extractors, safety screens, spawning dishes, thermometers, &c.

**EDINBURGH MUSEUM OF SCIENCE AND ART.** gh, Prof. T. C. Archer, Director. (1) Model of Salmon Ladder (in case), designed rs. Leslie & Son, Civil Engineers, Edinburgh. (2) 3 Models of Salmon Ladders, d by Messrs. Leslie & Son, Civil Engineers, Edinburgh (in case). (3) Model of Net, made by Mr. Alexander Speedie, Perth. (4) The Muszynski Apparatus for ting the fry of fish; by this apparatus 10,000 fry of Coregonus Baeri were safely d from St. Petersburg to Edinburgh, and a Collection of Fishing Appliances used aró Island Fishermen.

**BOLTON, THOMAS**, Naturalist, 57, Newhall Street, Birmingham. ing Microscopical Organisms from Freshwater and Marine Life shown under the po. (2) Portfolios of Drawings of the same (3) Album of Seaweeds. (4) Aquaria, rine and Freshwater, adapted for Microscopical Organisms, with circulation of water.

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ARE THE MANUFACTURERS OF THE

**RMY REGULATION VALISE.**

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SRS. ANDERSON, ABBOTT & ANDERSON, [COPY.] HORSE GUARDS, 12*th June*, 1871.

The Valise made by your firm has been found well suited for the conditions proposed, viz., to able an officer to carry the articles absolutely required for service; and the waterproof sheet wers as a bed; the whole, fittings *included*, not exceeding forty pounds weight. The pattern been *deposited at the Horse Guards for inspection*.—ARTHUR HERBERT, A.A.G., Col.

(5) Revolving Microscope Tables. (6) Collecting Apparatus. (7) Microscopes and acces for the examination of living organisms. In the course of the season the male Stickl *Gasterosteus* will be shown in charge of its nest and brood of young fry. (8) Seaweed mo by Miss Boning.

756*a*. **FISHERIES PRESERVATION ASSOCIATION**, per A. Kinloch, Secretary, 17 Seymour Street, Portman Square, W. (1) Models of Salmon (2) Model of Weirs, with fish passes. (3) Models of Putchers, &c.

757. **KESSELL & SON**, 11 Southwark Street, Borough, London, (1) 4 Fountain Aquaria with Fish, &c. No. 1 size, but in various decorations. Liv and other Fish. (2) Fountain Aquaria. No. 2 size in variety of decoration. Fitte Live Gold and other Fish. (3) 2 Fountain Aquaria, with Ferns or Flower Stands combin (4) 2 Oblong Aquaria on Stands (Ornamental), with living Fish. (5) 2 Round Aqua Ornamental Stands, with Fish, &c.

758. **SPRATTS' PATENT FOOD**, Henry Street, Bermondsey, London (1) Food for Rearing Young Fry and Feeding Adult Fish. Obviates the trouble exper by fish rearers in preparing food, and minimises the tendency to that destructive d Mould. (2) Food for Coarse Fish. (3) Ground Calcined Oyster Shells for Game and P (4) All kinds of Ship's Biscuits.

759. **CLARK, JOHN**, 17 Royal Exchange Square, Glasgow. (1) Mo Williamson's Fish Hatching Trough, fitted with a wire cloth basket, similar to those u the Salmon Hatching Establishment, near Cloud River, California. (2) Also a set of Steel Wire Grilles, new style, which can be made at a moderate price.

760. **BAPTY, SAMUEL LEE**, 65 Blackheath Road, Greenwich, (1) One set of Littlewood's porous terra-cotta Fish Hatching and Rearing Apparatus, co of six terra-cotta pans arranged on stage, the lower ones taking the overflow water fr top. (2) Littlewood's Improved Tank Aquarium on stand. The improvement consists arrangement of the overflow, which is taken from the *bottom*, thus retaining the fresh most highly oxygenated water near the top, and also clearing away the excrements, &c., collect at the bottom.

761. **FOLEY, R.**, Lismore, Ireland. (1) Model of a Salmon Weir. Maps and Plans. (3) Model of Clondulane Fish Pass. (4) Model of Fernsoy Fish Pass.

762. **RAGLAN, W.**, 15 Mornington Road, New Cross. New desig Aquarium.

763. **PHILLIPPS, THOMAS, & CO.**, St. John's Market, Liv British and American Oyster Merchants. Kenmare River Natives, Malahide Nativ Americans, Carlingford and Cleethorps.

764. **ARMISTEAD, JOSEPH J.** Oysters.

765. **DE CORBIGNY, H.**, Auray, Morbihan. Oysters.

766. **DE LA RICHERIE, G. G.**, 4 Rue Cale Ory, Lorient. Oyster

767. **SEASALTER & HAM OYSTER CO.**, Whitstable, Kent; 11 Lower Thames Street, London. (1) Model of "The Company's" Oyster Breed Rearing Establishment at South Hayling, Hampshire. (2) Spat Collectors. (3) Mo Apparatus for Rearing and Protecting Young Oysters. (4) Model of portion of Oyster G at Whitstable, with Boats, &c., showing mode of fishing, &c. (5) Specimens sh progressive growth of Oysters, &c.

768. **WHITSTABLE OYSTER COMPANY.** Oysters. (See No. 741.)

768*a*. **PELARGIE, V.**, Rochefort S/mer. Oysters.

769. **SOFTLEY, R. T.**, Central Works, Row 63½ King Street, G Yarmouth. Tanks used in Fish-Hatching Establishments.

771. **AUSTEN, A.** Oysters.

772. **OYSTER MERCHANTS' COMPANY**, Hampstead. Mode Oyster Farm and specimen of Oysters.

WATERPROOF DRIVING
APRONS AND KNEE RUGS.
ANDERSON, ABBOTT, AND ANDERSON,
India Rubber Manufacturers,
37, QUEEN VICTORIA STREET, LONDON, E.C.

. **WISEMAN, FREDERICK**, Paglesham, Rochford, Essex. Living ad specimens of Native Oysters, Oyster Brood, and Dog Whelks, &c.

. **WOODS, W. FELL**, Gorse House, Forest Hill, S.E. (1) Implements pparatus used in oyster culture. (2) Specimens illustrative of the development and of oysters bred artificially, &c.

. **DILNOT, G.**, Hayling North, Havant, Hants. (1) Economical nces for Oyster Culture. (2) Tiles, boards, and canvas spat collectors. (3) Canvas g Trays for first stages of growth after detachment. (4) Trays for ultimate growth. ir of oyster-lifters. (6) Brood Harrow.

. **ERNE FISHERIES**, Ballyshannon, Co. Donegal, Ireland. del of Fish Hatching House, with Troughs complete. (2) Model of Pond for retaining for Spawning purposes. This is placed at end of fish house.

. **SMALL, W. T., & SONS**, 37 Brecknock Road, 48 King's Road, and wington Green Road, London, N. Patentees and Manufacturers of Hydraulic Apparatus sing a running stream and cleansing Aquariums. (1) Ponds with Hatching Box and Glasses. (2) Globes for Fish, &c.

. **BERNEY, GEORGE DUCKETT**, Morton Hall, Norwich. del, one-third size of tub, with diaphragm and perforated zinc plate for transporting h; internal parts shown which prevent fish from being bruised or choked with dirt. del of Improved Carboy for transporting live fish. (3) Model of Box suspended over for feeding fish with maggots, so that they may not be dried up by the sun.

. **KING, GEORGE HOADLEY**, Sea Horse House, 165, Great Port-treet. (1) Rustic Fish Hatching Apparatus, invented by G. H. King in 1863, and d to the South Kensington, Derby, and Liverpool Museums. (2) Dippers for removing d food for young fishes. (3) Sea Water Aquaria (7 ft. × 6 ft. long, 4 ft. wide, 2 ft. containing living specimens of Hippocampi or Sea Horse, &c. (4) Reptile Case con- Tortoises, &c.

. **ERNE FISHERIES**, Ballyshannon. Oysters.

. **YOUNG, ARCHIBALD**, Advocate, Inspector of the Salmon ies of Scotland, 22 Royal Circus, Edinburgh. Salmon Pass or Morphie Dam, one of apest and most successful fish-passes ever constructed in Scotland. It cost only £100, s designed, not by an engineer, but by a practical fisherman, known in the North Esk t as "Skipper" Scott.

. **MANN, T. J.**, The Grange, Bishop Stortford, Herts. Models of a reeding and Rearing Establishment for 100,000 Salmonidæ.

. **ARMISTEAD, JOSEPH JOHN**, Solway Fishery, Dumfries, (1) Model of Hatching Establishment. (2) Hatching Apparatus. (3) Apparatus for rt of Fish and Ova. (4) Sundry Apparatus connected with Fish Culture. (5) Food . (6) Sundry Piscicultural Appliances. (7) Water Plants in relation to Fish. (8) Set ass tubes showing young Salmon in ovum and weekly growth after hatching out from to 42nd day. (9) Illustrations of the development, &c., of Fish.

. **MALCOLM.** Salmon Pass at Glengarry, River Lochy.

. **ANDREWS, THOMAS**, Westgate House, Guildford. (1) Tank, ft., containing large Trout, 3 years old and upwards. (2) Tank 9 ft. × 4 ft., con- food for Trout. (3) Tanks 9 ft. × 4 ft, containing Yearling Fish. (4) Hatching and g Trough, 9 ft. × 4 ft. (5) Hatching Trough, 9 ft. × 4 ft., to bring on to feeding 120,000 Salmonidæ. (6) Rearing Trough, 9 ft. × 4 ft., containing yearling fish. aring Trough, 9 ft. × 4 ft., containing 2 year old hybrids. (8) Hatching Trough, 1 ft., to bring on to hatching point 100,000 ova. (9) Hatching and Rearing Trough by 1 ft., containing Fry and natural food for Trout.

. **CAPEL, CHARLES CECIL**, Cray Fishery, Foots Cray, Kent, d. (1) 2 Holton's Patent Hatching Apparatus. (2) Capel's Hatching Apparatus. llection of Hatching Apparatus. (4) Collection of Implements and Appliances for ulture. (5) Collection of Feeding Apparatus for Fry and older Fishes. (6) Samples

**ISLAY WHISKY.**

**W. & J. MUTTER, Bowmore Distillery, Islay.**

*Counting House*—41, ANN STREET, CITY, GLASGOW.

*Agents*—Messrs. TWISS & BROWNINGS, 47, Mark Lane, London.

THE ABOVE WHISKY TO BE HAD BY ORDERING THROUGH *WHOLESALE HOUSES* AND BROKERS.

of methods of carrying Eggs of Salmon and Trout. (7) Methods of conveying Fish distances.

789. **BINGHAM, G. T.** Oysters.

790. **BROWN, J. M.**, 33 High Street, Haddington, Scotland. Orna Aquarium with self-acting fountain.

791. **ASHTON & GREEN, Limited,** 11 Bury Street, St. Mar London, E.C., Temple Gate, Bristol, and Festiniog, North Wales. (1) Slate Trough and Overflow Trough. (2) Model of Slate Rearing Trough.

792. **WOOTTON OYSTER FISHERY,** Isle of Wight. (1) Mo an Oyster-breeding Pond. (2) Specimens (living and dead) of Oysters bred in P Tiles. (3) Other Collections and Microscopic Objects.

DIVISION XXXVIII.—[*West Arcade.*] *See Plan, p.* 92.

**Models and drawings of diseases of fish, with special refe to their origin and cure.**

795. **SEARLE, E. W.,** 11 College Place, N.W. Diseased Salm and painted to life.

796. **KING, GEORGE HOADLEY,** Sea Horse House, 165, Portland Street. (1) Large Kelt Salmon, sent to the first Quekett soirée, with arro parasites in the gills, taken in Col. Townley's water, Whitewell. (2) Diagrams of the as shown under the microscope, living.

796*a*. **STUART-WORTLEY, COL.** Model of Marine Fish-ha house.

DIVISION XXXIX.—[*Outside Corridor, Fish Market.*] *See Plan, p.* 7

**Processes for rendering streams polluted by sewage and che or other works innocuous to fish life (illustrated by model drawings).**

797. **MANUFACTURERS' AND MILLOWNERS' MUTUAL ASSOCIATION,** 5 The Sanctuary, Westminster, London, S.W. Proce rendering streams polluted by sewage and chemical or other works innocuous to (illustrated by models and drawings).

798. **NATIVE GUANO COMPANY LIMITED,** Sewage Aylesbury. (1) Purification of Sewage by the Company's processes. (2) Fi in water purified by the above processes. (3) Plans and Models of works for pr river pollution. (4) Native Guano, the resulting manure. (5) Agricultural and Ho specimens. (6) Microscopic Illustrations.

DIVISION XL.—[*Eastern Arcade.*] *See Plan, p.* 26.

**Physico-chemical investigation into those qualities of sal fresh water which affect aquatic animals; investigation o bottom of the sea and of lakes, shown by samples; aquatic p in relation to fishing, &c.; researches into the aquatic (animals of the several classes preserved in alcohol or prepared, apparatus and implements used in such researches.**

799. **RAE, C. S.,** Allesley, Coventry. Marine Glasses, Microscope Magnifying Glasses for showing the parasites and disease on fish, and the anguillula animalcules found in the intestinal canals of fishes, &c., as exhibited at Edinbu Norwich.

**SEWAGE PURIFICATION.**
**(A. B. C. PROCESS.)**
In operation at the EXHIBITION (see above) and at the SEWAGE WORKS, AYLESBURY, where all information may be obtained on application to
THE NATIVE GUANO Co., Limited.

## NATURAL HISTORY.

ating fisheries, their present uses and the benefits which might be derived
e inquirer soon becomes conscious of the necessity of studying many branches
istory," both in the vegetable and animal kingdoms, without a competent
which his labours will often be thrown away, or the results of his researches useless,
y misleading. Fisheries are variously regarded by different classes; thus the fisher-
oncerns himself as to what he can obtain from them at the present time, regardless
visions for the next year's supply. The public mainly interest themselves in
fish as disposed of for food; while the scientific economist bases his conclu-
g the value of fisheries in accordance with their produce, and should the supply
the demand he mostly advocates increased killing powers by the employment
ictive agencies, erroneously believing that the stock in the sea is inexhaustible.
t and fish culturist ought to approach the question from an entirely different
he should ascertain the life-history of all forms of fishes, not merely such as
an food, but also of those which form the sustenance of the more predaceous
ould endeavour to collect reliable information respecting the plants and animals
them sustenance and shelter, as well as ascertain what are their enemies or
and what conditions favour the presence or absence of either class. Irre-
e foregoing, he should consider the relationship of temperature, currents, soils
s conditions of the water in which they reside, to their migrations, growth
production. He should also ascertain whether fish are increasing in numbers
if the supply remains unchanged; if the size of those captured is augmenting
if their condition is better or worse than it was. Should investigations lead
de that fisheries are being unduly depleted, he should carefully note in what
h such is occurring, if possible the cause, while in marine forms it is likewise
aquire if fishermen have to go further out to sea to obtain their captures, if
vers of their implements have increased, and whether more men are now required
same amount of fish than was the case a few years previously. Lastly, it may be
unless the investigator is able to distinguish the various species, he may easily
e sees in some small forms, as the solonette (*Solea minuta*), the young of the
kinds, as the common sole (*S. vulgaris*), whereas he is merely examining one
rthless, except as food for the larger kinds. Our fresh-water fishes are divisible
r "fluviatile" and the "lacustrine" or lake forms, while our marine ones may be
shore or "littoral" and "pelagic" or sea species; these last being again sub-
ch as are generally found near the surface, at greater or mid-depths, and abyssal
uch as live in the deep sea, below the limits to which the sun's rays penetrate.
ishes may be permanent residents therein, as carps; "anadromous," or merely
the ocean for the purpose of depositing their spawn, and generally, but not
ving their young to be reared there, as the salmon: "catadromous," or such as
waters, visiting the littoral zone or sea in order to breed, as eels, the young of
into and are reared in our rivers. To meet the destructive agencies to
gs and young are subjected, fish are provided with a large amount of ova,
tly sufficient to counterbalance natural waste. Thus eleven millions of eggs
ken from a 21-lb. codfish; 550,000, from a mackerel; 239,775, from a 4-lb.
a salmon deposits about 800 for every pound's weight of the parent fish.
st forms are polygamous, some are monogamous. The period of the year at
ng occurs, the size of the eggs, the depth of water in which they are deposited,
take incubating, and the places selected for the ova are exceedingly varied.
od float in the sea until the young emerge, those of the herring sink to the
by means of a glutinous substance they are attached to sea-weeds, rocks and
those of some species of flat fishes float so long as the water is agitated, subsiding
oth. One form of sea-sucker (*Lepidogaster*) affixes its eggs to the inside of a
butterfly does to a leaf. The gar fish (*Belone*) has filaments springing from the
of its ova, which enables them to adhere together in a mass or attach them
substances. Anadromous forms deposit their eggs in running waters

of great attention, as in fish culture crosses between the trout and the
most successful, while the stocking of fresh waters by artificial means, an
are among the most satisfactory accomplishments of modern fish culturis
Young fishes for varying periods after birth are sustained by the nu
in the yolk of the egg or dependent umbilical sac, and during this period t
enemies watching to make them their prey. Unable to stem strong
generally to be found concealed near the sides of streams or ponds, or el
of stones, leaves of water plants and grasses; while the marine species ar
in the sea, or disporting themselves in the sunshine, and these places
their nurseries, which should not only be left undisturbed, but protecte
foes. As the yolk sac becomes absorbed, the fry of fish have to seek for the
a minute vegetable or animal character, and it is then that the eggs and yo
classes of animals (the invertebrata) become invaluable for their subsistence
around our coasts or in fresh or brackish waters are various kinds of sea-wee
the sea decrease in abundance with increasing depth, or should they dri
they fall to pieces, sink and form the basis of soft black mud in which mar
brates find their food, while in their turn they afford sustenance for fishes.
being useful along our coasts as providing food for fishes, places for depo
nurseries for sheltering and rearing the fry, there are likewise forms some
scopic, floating in vast quantities over the surface of the deep sea, as the so-c
gulf weed. Sponges, in both their fresh-water and marine kinds, and which
the group Protozoa, were long considered by some authors to be vegetabl
animal organisms. The horny skeletons of some species are exceedingly
purposes, while those of commerce are to a great extent brought from the Gr
the Red Sea and the Bahamas, where they are obtained by divers. Many of
the compound colonies of the fixed and plantlike sea firs (*Sertularidæ*) a
found in our seas, some in large quantities, and they are consumed by fish
animals. There are also in this group the jelly-fishes, medusæ, which durin
autumn months are found floating in the ocean around our coasts, and occas
umbrella-like discs young fish have been observed to obtain refuge from
enemies. Corals among the Actinozoa in many ways hold a most importan
hard structures are exceedingly diversified and interesting. Commercial fa

ied animals, commonly known as shellfish, constitute a most important class in the f fisheries, not merely in their providing adult fish with food, but also as some of l at the same period of the year, their eggs and microscopic young are useful as the fish fry. Some forms are likewise more directly employed by man as food s oysters, mussels, cockles, and periwinkles. The consumer needs no reminder as rce the first have become; and along the east coast of Scotland mussels for use attaining famine prices, while the belief appears to be almost general that there eries are retrograding. Many other forms of molluscs are much employed by line for bait, especially whelks, squids, cuttle-fishes, &c. Among the marine Echino-, sea-urchins, star-fishes, and the sea-cucumbers, *Holothuridæ*, all assist more or viding food for fish, while a species of the last is largely consumed as food in ere it is looked upon as a luxury under the name of "trepang." The true worms es are indispensable to fisheries. They are divisible into the abranchiata, or gill-less ch contain earth-worms and leeches, and the branchiata, or gilled kinds, which be-worms and sand-worms, &c. The Annelids comprise many forms largely employed r fish, and some, as the lob-worm, are very useful for bait; others, as leeches, are l to fish. Insects have been said to be nature's most favoured creation, having in them all that is beautiful and graceful, interesting and alluring, or curious and n every other class of her (nature's) productions. They are placed by entomologists reat divisions, in accordance with whether they pass through a metamorphosis or if they do whether such is complete or incomplete. Many insects form food for ome stage of their existence, while others are very destructive to fish eggs. Crus- most generally known as lobsters, crabs, shrimps, prawns, &c., and are variously different zoologists. All crustacea are water breathers; some having eyes placed stalks, while in others they are without stalks, being sessile or immovable. All uccessive moultings or changes of shell, at which times lost parts become renewed. lier stages of the lower crustaceans, they emerge from the egg as a small body, having eye and two pairs of limbs (so-called Zoea stage), while as they gradually attain the e new segments and new limbs appear. In their earlier stages crustacea become portant article of food for fishes, while their adult forms are likewise esteemed by redaceous kinds. The class of Amphibia comprises newts, frogs and toads, and in ities frogs play a not unimportant part in fisheries, as they not only devour the ova se the fry, while their own spawn in turn becomes food for fish, and a frog is highly by many fresh-water fishes. Reptiles (or Reptilia), including tortoises, turtles, terra- es, lizards, crocodiles and alligators, are more destructive to fish than are the true s. The Chelonians are usually divided into the swimming turtles, the mud turtles or es, and the terrapins, and lastly the land tortoises. Some of the snakes and serpents ntly found in fresh water, where they are inimical to fish; while in the seas of hot re the venomous water-snakes (*Hydrophidæ*); these have a laterally flattened tail, uatic life, and live mostly on fish. Crocodiles and alligators abound in the fresh and aters of hot countries and are large consumers of fish, but the form best adapted for it is perhaps the gavial of India, which often attains to twenty feet in length, and is throughout the Indus, Ganges, Brahmaputra and Mahanuddi rivers. The gavial long and slender snout with a narrow mouth, they toss captured fish into the air, y descend catch them and swallow them head first. Among birds, as is well known, are the swimming ones, as the gannets, cormorants, gulls and terns of our coast, structive to sea fish, but the last two extend their range to inland waters, where, the dabchicks, coots, moorhens, herons, &c., assist in depopulating fisheries. Among the whale and seal fisheries are of great importance commercially. The whales, and porpoises or Cetacea themselves destroy immense quantities of fish. So also do quatic or amphibious seals; while the otter in fresh and brackish waters is a large mer, although in the east it appears mostly to prefer frogs.

FRANCIS DAY.

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DIVISION XLI.—[*West Arcade.*] *See Plan, p.* 92.

**Acclimatisation of fish.**

**800. EXETER, MARQUIS OF,** Burghley House, Stamford. (W
Silk, Pisciculturist to the Marquis of Exeter). Illustrations of the acclimatization of Fi

DIVISION XLII.—[*East Quadrant.*] *See Plan, p.* 102.

[AQUARIA.]

**Specimens living (marine and fresh water), fresh, stuffed preserved, casts, drawings, and representations of—**

(*a*) Algæ to be arranged under genera and species with localities appended

**804. BOLTON, THOMAS,** 57 New Hall Street, Birmingham.
Weeds. Mounted by Miss E. H. Boning.

**805. BROTHERSTON, ANDREW,** Shedden Park Road, Kelso, N
Collection of British Aquatic Plants (exclusive of Algæ).

**806. COOK, JAMES,** 3 Moss Street, Paisley, N.B. Collection of Bri
Marine Algæ.

**807. WHITSTABLE COMPANY OF FREE FISHERS A**
**DREDGERS,** in the County of Kent, known as "*Whitstable Oyster Company,*" Th
G. Browning, Clerk, Whitstable. (1) Algæ. (2) Sponges. (3) Zoophytes and Polyp
*Teredo Navalis.* (3) and (4) lent by Sibert Saunders.

DIVISION XLIII.

(*b*) Sponges, in their natural state.

**808. DRAKE, J.,** 37 Burghley Road, Highgate Road, N. Marine Ve

**808*a*. LEE, HENRY,** Margate. Sponges, recent and fossil.

**809. RAPP, L. F.,** 4 Grove Place, West End, Hammersmith, Lon
Group of Venus's Flower Baskets *Euplectellæ speciosæ*) from the Philippine Islands

**809*a*. GARDNER, MISS** (the collection of the late Mrs. Gu
Hampstead, London. Sponges, &c., in their natural state.

DIVISION XLIV.

(*c*) Corals, in the natural state, polyps, jelly-fish, &c.

**810. BRASSEY, LADY,** Normanhurst Court, Battle, Sussex. Lar
series of Corals, Sponges and Gorgoniæ, from the Indian, Japanese, Fijian, and Au
Seas—including the following species new to science: Distichopora Brasseyi, D
Allnutti, Balanophyllia Kalakauai, and Brasseyia radians; described in the Ann. and
Nat. Hist., vol. ix. No. 50, 1882, by Mr. Bryce Wright, F.Z.S. Collected during the
the "Sunbeam."

**811. BRAZENOR, CHARLES,** 39 Lewes Road, Brighton. Model
Octopus, taken from specimen lately in the Brighton Aquarium.

**812. BURROUGHS, Lieut.-Gen. F. W. TRAILL, C.B.,** R
Orkney, N.B. (1) Specimens of White Coral found on the shores of Rousay, Orkney, N.B.
(2) Specimens of Shell Sand found on the shores of Rousay, Orkney, N.B.

**ANDERSON, ABBOTT, & ANDERSON,**
**Makers of the Waterproof**
NAVY REGULATION COAT AND CAPE,
37 QUEEN VICTORIA ST., LONDON, E.C. WORKS—LIMEHOUSE, E

## Division XLV.

(*d*) Entozoa and Epizoa.

13*b*. **WRIGHT, BRYCE,** F.R.G.S., F.Z.S., &c., 204 Regent Street, on, W. (1) Series of Corals and Sponges. (2) Collection of Marine and Terrestrial s, amongst which is the type specimen of Spondylus Wrightianus, Crosse.

14. **CLARK, JOHN,** 17 Royal Exchange Square, Glasgow. Small case. eating Bug (*Belastoma Grandis*) and small Trout.

14*a*. **TUDOR, JOHN R.,** St. Leonards-on-Sea. Æga tridens, called by Northmaven (Shetland) fishermen a *bee*.

his small sessile-eyed crustacean, first noticed by Leach, resembles in outward appearance a gigantic wood-is about an inch and a half in length, of a light crab-like colour, and with a hard crustaceous covering. It ls on certain *long lanes* or channels with a sandy bottom, on which the fishermen never shoot their lines in foggy weather when unable to get their bearings. Should they do so all the ling, tusk or cod they may are rendered useless by the *bees*, which, when a fish is hooked, "get on to it in myriads, enter in at the gills y evidently cannot pierce the skin) and detour all but skin and bone, so that when the fish is hauled up it s plump and round as a live fish, only when they come to open it, it is found to be quite full of *bees* and g else." Skate and halibut they do not seem to attack, probably because these fish keep their gill covers when hooked. "The fishermen have sometimes taken a few of these live *bees*, put them into a vessel, with ster, dropped a piece of fish in, and immediately all rushed to it, and clung fast until it was devoured."

15. **YOUNG, ARCHIBALD,** Advocate, Inspector of the Salmon eries of Scotland, 22 Royal Circus, Edinburgh. Photograph of "Belastoma Grandis," sh-eating Bug of the State of New York, in the act of killing a Trout.

15*a*. **DOHRN, DR.,** Naples. Entozoa and Epizoa.

## Division XLVI.

(*e*) Mollusca of all kinds and shells not included in Class III.

16. **BAYLIS, WM. H.,** 35 Maiden Lane, Covent Garden, W.C. (1) Pair hells, in Case. (2) The Great Oyster from Singapore, "Tridacne Gigantea," measuring 4 in. by 2 ft. 2 in., and weighing 3 cwt. 3 qrs. 14 lbs. This is believed to be the finest n specimen, and has been in Rule's Oyster Warehouse upwards of forty years.

16*a*. **EDINBURGH, H.R.H. THE DUKE OF, K.G.,** Clarence se, St. James's, London, S.W. Collection of Mollusca.

17. **BRAZIER, ALBERT,** Southwick, Brighton, Sussex. (1) Collection Scallops and species. (2) Collection of Oyster Shells.

18. **FINDLAY, GEORGE,** Whitehills, Banff. Collection of Sea Shells Shell Fish.

19. **LAUGHRIN, WILLIAM,** Polperro, Cornwall. (1) Barnacles in its. (2) Lepas Fascicularis. (3) Lepas Anatifera. (4) Teredo Worm. The wood d by the Teredo or Ships' Worm. (5) Wood Piddock (Hylophaga Dorsalis).

20. **LOVELL, MATILDA SOPHIE,** Calke Abbey, Derby. Specimens edible Molluscs of the British Isles, with some of the continental marine, land, and water edible species, including the Cephalopodæ and Echinodermatæ.

21. **McLACHLAN, W. B.,** 21 McDowell Street, Edinburgh. (1) One Shells. (2) Curious old bottle with oyster shells, &c., attached, as it was brought up Prestonpans Oyster Beds.

21*a*. **SMITH, W. ANDERSON,** Benderloch, N.B. Collection of sca.

23. **FRANCK, S. M.,** 85 St. Mary Axe, London, E.C. Monster ese Crab, Appliqués of Mother of Pearl Japanese Shells, Piscatorial Emblems in Metal, Lacquer, &c., &c.

**MORSON'S PEPSINE** PREPARATIONS OF

Highly recommended by the Medical Profession for **INDIGESTION.**

As Wine in Bottles at 3s., 5s., and 9s.; Lozenges, 2s. 6d. and 4s. 6d.; Globules, 2s., 3s. 6d., and 6s. 6d.; and Powder, in 1 oz. Bottles, at 4s. each.

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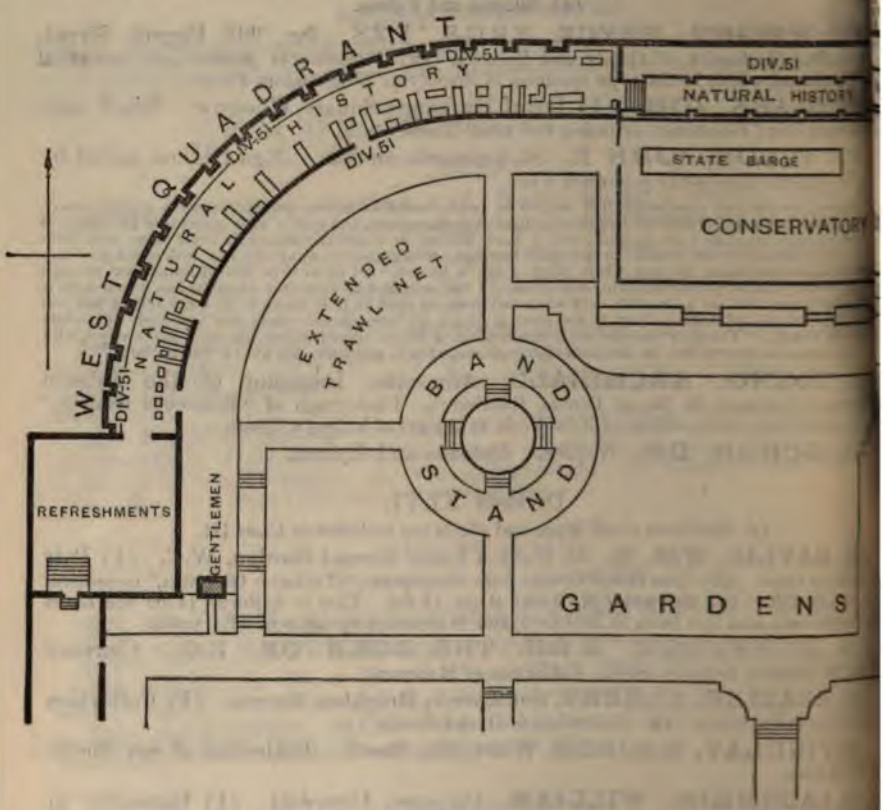


**823*a*. LEE, HENRY,** Margate. (1) Oyster Spat attached to various substances. (2) Growth and Structure of the Oyster's Shell. (3) Fossil Oysters and Mussels. (4) Nautili, recent and fossil. (5) Sections of Shells.

DIVISION XLVII.

(*f*) Starfishes, sea urchins, holothuriæ.

**823*b*. LEE, HENRY,** Margate. Starfishes and Sea Urchins, recent and fossil.

DIVISION XLVIII.

(*g*) Worms used for bait, or noxious; leeches, etc.

**824. McINTOSH, PROFESSOR,** M.D., LL.D., F.R.S., University of St. Andrews, and Murthly, N.B. (1) Series of Original Coloured Drawings of Annelids by the late Miss Roberta McIntosh (Mrs. Albert C. L. Günther). Prepared for the illustration of

S. & H. HARRIS'S
WATERPROOF DUBBING
FOR SOFTENING AND RENDERING BOOTS & SHOES WATERPROOF.
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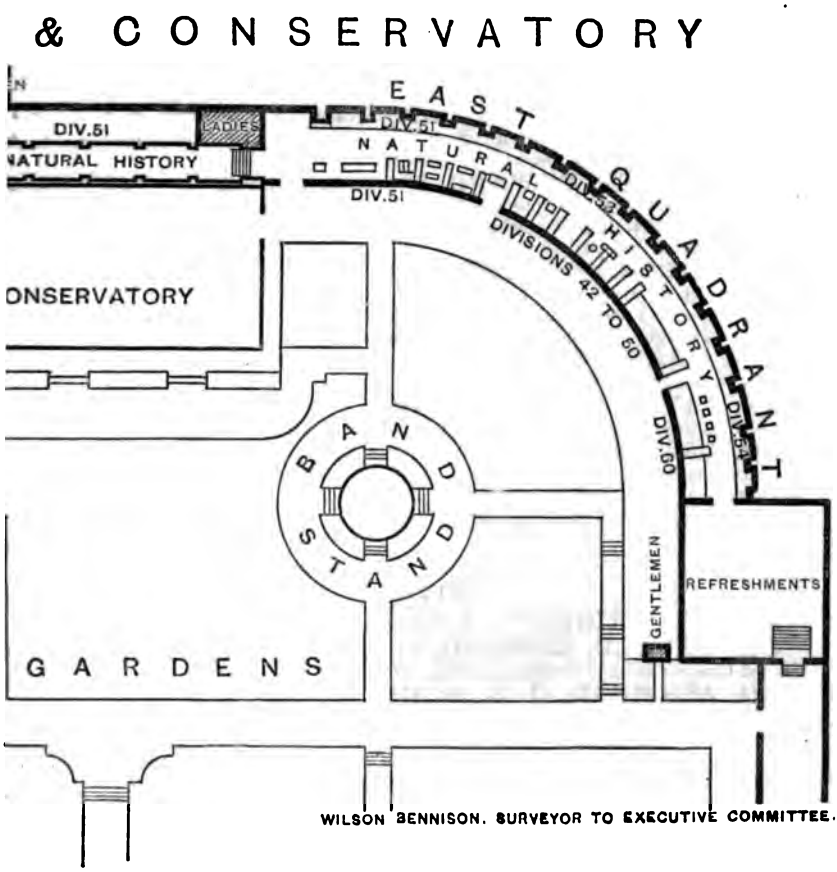


ritish Annelids," in course of publication by the Ray Society. (2) Series of Original d Drawings and Oil Painting, by the same lady, illustrative of the rarer Marine s of St. Andrews. (3) Series of Spirit preparations illustrating the development, s and food of the Salmon of the Tay.

## Division XLIX.

**erfect insects and larvæ of insects, which are destroyers of spawn or serve as food for fish.**

. **EEDLE, J.**, 40 Goldsmith Row, Hackney Road, London. (1) injurious to Fish. (2) Insects food of fish.

. **THOMSON, JOHN**, 1 Main Street, Inverallochy, Fraserburgh, enshire. Specimen of Food of Fishes preserved in bottles.

ANDERSON, ABBOTT, AND ANDERSON'S
ALL INDIA-RUBBER
FISHING BOOTS.
LIGHT, STRONG,
AND DURABLE.
87, QUEEN VICTORIA STREET, E.C.

## Division L.

### (*i*) Crustacea of all kinds.

826*a*. **LEE, HENRY,** Margate. Crustacea, recent and fossil.

827. **LAUGHRIN, WILLIAM,** Polperro, Cornwall. (1) Two Cas Crustacea. (2) Collection of about 100 kinds, all English, found on coast of Co (3) Crabs, 12 lbs. and 13 lbs. weight when living.

828. **LOVETT, EDWARD,** 55 George Street, Croydon. Micro Preparations by a new and approved method, by which the living appearance of the sp is preserved; illustrating the embryology and anatomy of the Crustacea and other branc Marine Fauna of the British Islands.

829. **POLAND BROTHERS,** Billingsgate. (1) One Case (Glass) taining a very large male Lobster caught off St. Ives, Cornwall. (2) One Case (G containing a very large male Craw-fish caught off St. Ives, Cornwall. Also, in same male Crab, caught off Start Point, Devon, and a peculiar pale-blue Lobster from Norway

829*a*. **FRANK, S. M.,** 55 St. Mary Axe, E.C. Monster Japanese C caught in the Bay of Yokohama, Japan.

830. **SAYER & CO.,** 100 Lower Thames Street and Billingsgate, Lo (1) One Lobster, 12 lbs. weight. (2) Case containing Craw Fish, Lobster and Crab.

831. **CARRINGTON, J. T., F.L.S.,** Royal Aquarium, Westmi Collection of Preserved Specimens of British Stalk-eyed Crustacea of the three divisi Macrura, Anoumara, and Brachyrura, and including all the species used as articles of collected and prepared under the direction of Mr. Carrington.

## Division LI.

### (*k*) Fish of all kinds.

831*a*. **ARKWRIGHT, R.,** 8 Cadogan Place, S.W. Cast of a Salmon.

832. **ARNOLD, EDWARD,** Campbell Yard, High Street, Hunting Glazed Case containing Stuffed Specimen of a Rudd. Weight, 2¾ lbs.

834. **ASHMEAD, G. B., & CO.,** Naturalists, 35 Bishopsgate St London, E.C. (1) Trophy of Freshwater Fish entitled "The Rod." (2) Freshwater F Barbel, Trout, &c. (3) Companion Fish—Carp, Bream, &c. (4) Jack. (5) Salmon Piscatorial Screen. (7) Piscatorial Marine. (8) Piscatorial Table and Lamp. (9) Groups illustrative of vicissitudes of Fish and Bird Life.

835. **BARBER, W.,** Naturalist, 19 Sincil Street, Lincoln. Stuffed Pi weight, 8 lbs., and group of Perch and Roach in case. This is a new and improved proce preserving as much of the natural colours as possible without the addition of paint or other material whatsoever.

836. **BARTLETT, A. D. & SON,** Zoological Gardens, Regent's Pa N.W. (1) Glass Case containing Teeth and Jaws of Great Blue Shark, Arctic Shark, Shark, Crab-eating Skate, Rhina Skate, Common Skate. (2) Skull and Teeth of Elephant Seal or Sea Elephant, Sea Lion, Greenland Seal, Common Seal. (3) Manatee. (4) Dugong (5) Walrus. (6) Crocodile. (7) Spiny Skate Skin. (8) Squaco Heron. (9) Buff-backed Heron. (10) Penguin. (11) Kingfishers.

837. **BEASLEY, A. W.,** 14 Greville Place, Maida Vale, N.W. Stuffed Specimen of a "Pike-Perch" (*Lucioperca sandra*) from the Danube, weight 12 lbs. in Glass Case.

837*a*. **BENJAMIN, JOSEPH,** 67, Cambridge Road, Mile End. Stuffed Roach.

838. **BERMONDSEY BROTHERS ANGLING CLUB,** Alb Arms, Alscot Road, Bermondsey. (1) Perch in Case. (2) Roach in Case. (3) Two Pi in Case. (4) Rudd in Case. (5) Carp in Case. (6) Jack.

WATERPROOFS FOR BOYS,
In Tweed, Paramatta, and other Materials.
WATERPROOF LEGGINGS & SCHOOL SATCHELS.
ANDERSON, ABBOTT, & ANDERSON,
37, Queen Victoria St., London, E.C.

. **BIRMINGHAM AND MIDLAND PISCATORIAL ASSO-**
**ION,** James Gregory, Hon. Sec., 39 Vyse Street, Birmingham. (1) Pike 27 lbs. (2) 3 lbs. (3) Pike 20 lbs. (4) Pike 20 lbs. (5) Pike 18 lbs. (6) Pike 18 lbs. (7) 13¼ lbs. (8) Barbel 8 lbs. (9) Barbel 6½ lbs. (10) Bream 5½ lbs. (11) Bream (12) Perch 2 lbs. 2 oz. (13) Salmon 18 lbs., killed by a larger fish in the River presented to the Association by Alan Bagot, Esq., Trent Conservator. (14) Perch , taken on one of the Norfolk Broads. (15) Roach 1¾ lbs. (16) Roach 2 lbs. (17) hub 16 lbs. (18) Char. (19) Perch 1¾ lbs.

a. **BRIGHTON AQUARIUM COMPANY.** Skeletons of Dolphin ampus.

. **BROOKWELL, H. G.,** 15 Belmont Villas, Leyton Road, Leyton. y-five Cases Stuffed Fish.

. **BROTHERSTON, ANDREW,** Shedden Park Road, Kelso, N.B. of Stuffed Salmondiæ from the Tweed, in various stages and conditions.—Old Red (male) Salmon, 44 lbs., length 50 inches (Kelso Museum); Kipper, 30 lbs.; ditto, ; Red ditto, "Gray School," 20 lbs.; Black ditto, 17 lbs.; Baggit Salmon (unspawned ), 21 lbs.; ditto, affected with *Saprolegnia ferax*, 17 lbs.; kelt (spawned female), ditto ; Clean Salmon, slightly diseased on nose, 10 lbs.; kipper grilse, 8½ lbs., &c., preserved hibited by A. Brotherston.

2. **BRUNTON, JOHN,** M.A., M.D., 21 Euston Road, London, N.W. se of Lea Trout, Stuffed Jack, Grayling. (2) Case of Lea Trout, taken by artificial fine gut and landed without net, gaff, or assistance, 5 lbs., 4¼ lbs., 3½ lbs. (3) Jack, , taken when fly fishing on single hair, and landed without net, gaff, or assistance. (4) f seven Grayling, caught with artificial fly on fine drawn gut, 3½ lbs. to 1½ lbs. each.

2a. **BUDGE, W. H.,** 1 Queen's Gate Place Mews, South Kensington. of Sea Wolves Stuffed.

3. **BUNN, HENRY HOWARD,** Palmerston House, Ventnor, Isle of t. A Lump Sucker, caught at S. Leonards, January 8th, 1883. Length 22 in., depth , weight 16½ lbs. Stuffed and set up by Exhibitor.

4. **BUTLER, JOSEPH,** "True Waltonian Society," "White Horse," erpool Road, E. One Chub. (Cast.)

5. **CALLAGHAN, JAMES,** 36 St. Mary at Hill, Eastcheap, London. mes Chub, taken by the Exhibitor with rod and line, weight 5 lbs. 12 oz.

6. **CAMPBELL, LORD COLIN,** 79 Cadogan Place, W. Studies of ranean fish in Water Colours.

6a. **CAMPION, ROBERT,** 3 Comber's Terrace, Brixham, Devon. Stuffed Lobster.

7. **CARR, MRS. WALTER PATERSON,** High Street, Berwick-ed. (1) A Sea Wolf, caught in Berwick Bay. Weight, 33 lbs. (2) Sea Parrot. (3) . (4) A Collection of deep-sea fish. (5) Sturgeon. (6) Sea Sow. (7) Cock Peddle. . (9) Codling. (10) Haddock, a Coal Fish. (11) Whiting. (12) Ling, Turbot. a Mouse, &c. All stuffed.

. **CARTWRIGHT, W. C.,** 27 St. Mary Axe. 1 Case of 2 Perch.

. **CHAMBERS, GEORGE,** 37 Fenchurch Street. Case of stuffed

**CLIFFORD, J. W.,** Three Colts, Cambridge Road, Bethnal Green. ed Barbel in Case, 12 lbs. (freshwater specimen).

. **COBBOLD, DR. SPENCER T.,** 74 Portsdown Road. Maida W. Parasites of Fishes and other aquatic animals.

. **COBURN, FREDERICK,** 7 Holloway Head, Birmingham. (1) Col-of Stuffed Freshwater and Sea Fish, exhibited without special regard to weight of fish. how correctness of outline, skill in the manipulation of fins, reproduction of natural and improvement in fitting up cases. (2) Sword Fish.

**Caution.** —THE ONLY ESTABLISHMENT presided over by Messrs. B. BENJAMIN & SONS is known as "ULSTER HOUSE," and is situated

*Between* Nos. 37 & 38, CONDUIT STREET, W.,

the entrance being between the statues of the Dogs, so well known as Messrs. BENJAMIN'S Trade Mark and a feature of Conduit Street.

849*a*. **COKER, JABEZ,** Paragon Railway Station, Hull. Two Cases Stuffed Perch.

850. **CONVIVIAL ANGLING SOCIETY,** "Bull and Bell," Ro maker Street, Finsbury. Cases of (1) Specimen Carp; (2) Three Specimen Bream; (3) Specimen Roach.

851. **CRESSWELL, HENRY,** "True Waltonian Society," "Wh Horse," Liverpool Road, Islington, N. Case, one Chubb, 6 lbs. 2 oz., valued at £5.

851*a*. **CRITCHFIELD, A. C.,** 1 Pownall Road, Queen's Road, Dalst London, E., per Alfred G. Jardine. Cases of (1) Three Tench, weight 9 lbs.; (2) One Tr weight 4½ lbs.; (3) One Barbel, weight 8 lbs.: (4) One Rudd, weight 1¼ lbs.; (5) One B weight 5½ lbs.; (6) One Pike, weight 14 lbs.: (7) One Dace, weight 1 lb.: (8) One Bre weight 1 lb. 11 oz.; (9) One Perch, weight 3½ lbs.; (10) One Perch, weight 2½ lbs.

851*b*. **CULLUM, H. J.,** 10 Harley Street, Battersea. (1) Skull Dolphin. (2) Flying Fish preserved in bottle.

852. **CURTIS, E., JUN.,** Mortimer Lodge, Upton, Essex. Case conta ing Head of Jew Fish, caught by Messrs. Curtis and Senior, ledgering, Brisbane Ri Queensland, Australia. While playing same, a Shark took half the fish below the dorsal f What we gaffed weighed 28½ lbs. Prawn bait.

853. **DAY, DR. FRANCIS,** Kenilworth House, Cheltenham. Compl series of British Sea and Inland Fish.

854. **DA COSTA, HYMAN,** 18 Peter Street, Tyssen Street, Beth Green. (1) Two Jack. (2) One Barbel. (3) Two Chub. (4) Two Carp. (5) Two Pe (6) Two Tench.

855. **DAVIE, JOHN HUNTER,** of the "West London Angling Cl 49, Shaftesbury Road, Hammersmith, London. One Stuffed Roach in case, 2¼ lbs., caught West Drayton.

856. **EASTWOOD, G. J.,** Cheshunt, Herts. Bream, weight 7¼ lbs., tak by Mr. G. J. Eastwood, in his private fishery, King's Weir, Cheshunt, Herts.

857. **EDWARDS, HENRY,** 100 High Street, Kingsland, London, Beautiful specimen of small Pike stuffed, weight 4 lbs., caught at Little Waltham, Ess 12th August, 1880. Dead Bait. Roach.

858. **EEDLE, THOMAS,** 40 Goldsmith Row, Hackney Road, Lond Preserved Fish, Pike, Perch and Tench.

859. **EILOART, E. G.,** 33 George Street, Hanover Square, W. Six Ca Stuffed Fish, preserved and cased by an amateur. Rudd 2 lbs. 10 oz.; Head of Pike, 16½ Trout, 2½ lbs.; Bleak (on wood) specimens for size only.

860. **ELLIS, JOHN,** Pritchard's Arms, Hackney Road. Preserved Ca

861. **ERNE FISHERIES,** Ballyshannon, County Donegal, Irela Case of stuffed specimens of products of Lake and River Erne.

861*a*. **MOORE, ROBERT L., D.L.,** Moluman, Londonderry. (1) O Cock Spait Salmon. (2) One Lake Trout. (3) Five varieties White Trout. (4) varieties Brook Trout. (5) One Pike. (6) One Silver Eel. (7) Two Bream. (8) Large Pike. (9) Two Char, L. Melvin. (10) Two Pollen. (11) One Otter. (12) Case of Sea Birds.

## RIVER SHANNON, Co. Clare.

861*b*. **REEVES, ROBERT W. C.** Angel Shark, taken near Kilru in Shannon.

862. **FOOT, W.,** 21 Waterside North, Lincoln. (1) One Roach Stuff weight 2 lbs. 4½ oz., in case natural, and caught by Exhibitor at Bardney near Lin (2) Barbott (or Eelpout) 4¼ lbs., in case, caught by Exhibitor at Bardney near Lincoln.

864. **FRIENDLY ANGLERS' SOCIETY,** The Albion, Albion Stre Hyde Park, London, W. Eighty Cases Stuffed Fish. Trout, 10 lbs. 13 oz.; Jack, 35

**MYOCOM FLY GUM.**

A STRING, Straw, or Twig lightly covered with this preparation (non-poisonous), and suspended from the ceiling, will keep any room free from flies, wasps, gnats, &c., &c.

"It is most efficacious and catches even wasps."—*A. Adnalls.* "The most perfect Fly Catcher he has ever used."—*Admiral Sumarez.* "Really invaluable."—*Capt. Sargfield.* "The first tin caught over 500 flies in half-an-hour."—*T. C. Taylor.* *Mrs. Walton's servants are* delighted with it.

Of all Chemists in 1s. tins, or by post for 1s. 2d. of the WHOLESALE PROPRIETORS:

THOS. CHRISTY & Co., 155, Fenchurch St., London.

bs. 2 oz.; Roach, 2 lbs. 5 oz.; Dace, 14½ oz.; Bream, 6 lbs. 8½ ozs.; Carp, 8 lbs.; s. 12 oz.; Barble, 9 lbs. 3 oz.; Tench, 8 lbs. 8 oz.; Rudd, 2 lbs. 3 oz.; Grayling, 2 lbs.

**GATHERCOLE, GEORGE,** 112 Akerman Road, Brixton. A containing a preserved and mounted Grayling. Weight 2 lbs. 6 oz.

**GEORGE, ALFRED,** 2 Dempsey Street, Commercial Road, E. Case of 1 stuffed Chub, 5½ lbs. weight.

**GEDNEY, C. W.,** Bromley, Kent. Thames Trout in case, 10 lbs. aken with spinning bait.

**GILL, ALEXANDER,** Selwyn Road, High Cross Lane, Tottenham. preserved Fish, 15 × 12 inches.

**GILLETT, JOHN,** 40 Fetter Lane, Holborn. Stuffed Perch, 5 lbs.

**GOOD INTENT ANGLING SOCIETY, THE,** Richard Murphy, , The Crown Inn, Church Street, Shoreditch. 40 Cases of Stuffed Fish, consisting of Dace, Pike, Trout, Perch, Tench, Bream, Rudd, Carp, &c.

**GORDON, LORD GRANVILLE,** 1 Queen Anne Street, London, t of a Salmon (painted by Rolfe) weighing 29 lbs., taken on the Dee, at Abayne, nshire with fly, in the month of September.

**GOUNDREY, JOHN,** 109 High Street, Oxford. Gar Pike, 2½ lbs.

**GRAY, HENRY,** 55 Charlotte Street, Portland Place. A Case con- two Trout caught with fly, weight 4lbs. 4 oz. and 4 lbs. 5 oz.

**GREAT NORTHERN BROTHERS ANGLING SOCIETY,** ampton Street, Pentonville, N. (1) Twenty Cases Preserved Fish. (2) Case con- two Bream, taken by Mr. W. Theobald from the River Wey at Woking, 17th October, Weights, 6 lbs. 9½ oz. and 4 lbs. 0½ oz. All fish are taken from the bank.

**GRESHAM ANGLING SOCIETY,** Mason's Hall Tavern, Avenue, Basinghall Street, E.C. (1) 1 Case of 3 Pike, united weight, 59½ lbs.; (2) of Perch. 1 in case alone, weighing 4 lbs.; 3 in case, weighing 8 lbs. 4 oz., largest z.; 2 in case, weight 5 lbs. 2 oz., largest 3 lbs. (3) 1 Case of Barbel caught with ly light rod, shown in case. (4) 7 Grayling in one case; largest 2¼ lbs. Specimens ake of 25 brace.

**GUNN, E. W., JUN.,** 47 Upper St. Giles Street, Norwich. Six Stuffed Perch, Roach, Dace, Rudd, Bream, &c., caught near Norwich.

**GUNN, T. E.,** 47 St. Giles Street, Norwich. Collection of Stuffed Sea and Fresh Water Fish, comprising about 63 species, and about 250 specimens. g brace of Perch, Weighing 8¼ lbs., Monster Sea Perch of 17 lbs., several Pike, one of Sticklebacks, four species of Bream, and notably the largest individual in England, g 11½ lbs., Mackerel, Wrasses, Carp, Crucian Carp; Gold Carp, 16 oz.; Barbel 11½ lbs. and Common Tench; Azurine or Blue Roach; Chub, 5½ lbs.; Minnow, 4 inches in Herring, Grayling, Smelt, Whiting Pout, 3 bearded Rockling, Broad-nosed Eel, 7 lbs. ump Suckers, Sharks, and others, nearly all caught in the county of Norfolk. They nted in groups, some representing remarkable incidents, illustrating life below the

**HARDING, CHARLES W.,** Assoc. M. Inst. C.E., King's Lynn, . Specimens of Smelts and other Fish in spirit.

**HAYWARD, THOMAS,** 275 Kennington Road, S.E. Case of four Weights, 3¼ lbs., 2¾ lbs., 2½ lbs. and 2¼ lbs. Total 10¾ lbs. Taken by Exhibitor, 11th, 1811, in an afternoon in private water at Staines. The largest fish was hooked a ht previous to time of capture, and when landed contained a portion of my line and hook ullet.

**HODGES, W. J.,** Aucuba Villa, Lavender Hill, S.W. Throat Teeth bel, Chub, Carp, Tench, Bream, Roach, Rudd, &c.

WATERPROOF DRIVING
APRONS AND KNEE RUGS.
ANDERSON, ABBOTT, AND ANDERSON,
India Rubber Manufacturers,
37, QUEEN VICTORIA STREET, LONDON, E.C.

**880. HOLT, EARDLEY CHAUNCY,** The Cottage, East Mortlake, Surrey. (1) A Pike's Head. The Pike weighed 38 lbs.; has a large Pe mouth. (2) A Pike's Head. The Champion Pike's Head of England. The fish w in Turner's Pond, near St. Leonard's Forest, Sussex, fifty years ago, and till within ten years was in the possession of the late Mr. Borrer, of Henfield, Sussex. The caught weighed 48 lbs.

**881. HORSLEY, CHARLES W.,** Fakenham, Norfolk. (1) Case Trout, weight 9 lbs. 11 oz. (2) Case Stuffed Trout, weight 9 lbs. 13 oz. Taken by in the River Wensum with Phantom Minnow. Landed after about twenty minutes'

**882. HOWLETT, W.,** High Street, Newmarket. (1) Thirty-Six Fish, Roach, &c., beside the special fish. (2) Monk Fish or Angel Shark, caught Norfolk. (3) One Freshwater Eel, taken in Suffolk, weight 30¼ lbs. (4) One Bu Pout, taken in Cambridgeshire, weight 4¼ lbs. (5) One Dace, taken in Suffolk, we 1 oz. (6) One Carp, taken in Cambridgeshire, weight 9 lbs. River fish. (7) O 6 lbs. (8) Two Roach, 4 lbs. 2 oz. (9) One Pike, 27½ lbs. (10) 2 Perch, 8 lbs. All taken from the Rivers Ouse and Lark.

**883. HOXTON BROTHERS ANGLING SOCIETY,** Tree," Kingsland Road, N. Preserved Stuffed Freshwater Fish in cases. Pike, R. Ghurney. (2) Three Perch, A. Brockett. (3) One Pike, J. Romer. (4) O J. Morgan. (5) One Perch, G. H. Wood. (6) One Roach, J. Amos. (7) Tw Jackson. (8) One Chub, H. Steadman. (9) One Roach, A. Pollard. (10) O (11) One Tench, J. Haggett. (12) Two Roach, J. Moore. (13) One Roach, J. Co Two Gold Carp, J. Benjamin. (15) One Tench, E. Brockett. (16) One Chub, (17) One Roach, Jenkins. (18) One Tench, R. Ghurney. (19) One Dace, B. B One Roach, A. Hattemore. (21) One Trout, J. Mann. (22) One Perch, J. Mann. Perch, J. Mann. (24) One Perch, J. Mann. (25) Two Chub, Tricker. (26) O J. Aldrige.

**883*a*. HUGHES, H. P.** Stuffed Pike, caught at Eastwell Park.

**884. HUGHES, T. S.,** Foxley Road, North Brixton. (1) Eleve Pike. (2) Six cases Roach. (3) Three cases Trout (4) Three cases Grayling. case Barbel. (6) Two cases Perch. (7) Barbel, 12 lbs. (8) Bull Trout, 1 One Pike, 26 lbs. (10) One Trout, 6½ lbs. (11) One Perch, 3 lbs. (12) One Ro 7 oz. (13) One Grayling, 1 lb. 9 oz.

**885. IZAAK WALTON ANGLING SOCIETY (THE),** Th King John's Head," Mansfield Street, Kingsland Road. (1) Six Cases of Pike. Cases of Bream. (3) Three Cases of Roach. (4) Three Cases of Tench. (5) Tw Carp. (6) Two Cases of Chub. (7) Two Cases of Perch. (8) One Case of Barbel.

**885*a*. JACOBS, E.,** Stuffed Charr.

**886. JARDINE, ALFRED GEORGE,** 38 Old Change, E.C. Cases containing Pike weighing respectively 36 lbs. and 37 lbs. (2) Pike, 2, 18 lbs. gross weight 40 lbs. (3) Pike, 1, weight 30½ lbs. (4) Pike, 1, weight 23 lbs. (5) Pike and 22 lbs., gross weight 40 lbs. (6) Pike, 1, weight 20 lbs. (7) Pike, 2, 14½ lbs. gross weight 32 lbs. (8) Trout, 1, weight 26 lbs. (9) Trout, 1, weight 19 lbs. 7, gross weight 22½ lbs. (11) Trout, 1, weight 8 lbs. (12) Bass, 1, weight 1 Perch, 7, gross weight 18 lbs. (14) Roach, 2, gross weight 3¾ lbs. (15) Casts in B weight 36 lbs. (16) Pike, weight 30½ lbs. (17) Pike, weight 26 lbs. (18) Perch, gross weight 12½ lbs. (19) Cast of Lump Sucker, "Cyclopterus Lumpus," 27 lbs.

**886*a*. JARDINE, FREDERIC, JUN.,** 38 Old Change, E.C. Perch on Plate. (2) Carp (7 lbs.) in basket.

**886*b*. BENINGFIELD, T.,** Broxbourne, per Alfred G. Jardine Cases of Three Bream, 21 lbs. gross weight. (2) One Carp, 14¾ lbs. (3) One Bre (4) One Trout, 11¾ lbs. (5) One Trout, 11½ lbs. (6) One Pike, 22¾ lbs. (7) Thre 9 lbs. All these specimens were caught in the River Lea,

**ANDERSON, ABBOTT, & ANDERSON'S**
**SAILOR'S AND FISHERMEN'S OILSKINS.**
Celebrated in Canada, Australia, New Zealand, Cape of Good Hope, Natal India, and China, as the only reliable makers of **OILSKINS** that can be packed for shipment, guaranteed to arrive in a marketable condition at their destination.
**37, Queen Victoria Street, London, E.C.**

6c. **FEATHERSTONE, R.,** Aldershot, per Alfred G. Jardine. (1) Case Large Pike. (2) One Case Large Pike. (3) One Case Large Pike. (4) One Case Chub.

6d. **KING, ROBERT,** Teddington, per Alfred G. Jardine. (1) One Trout, Thames, 12 lbs.

6e. **JACKSON, R.,** Little Marlow, per Alfred G. Jardine. (1) One Thames Trout, 10 lbs. 9 oz.

6f. **CROWLEY, J. WILLIAM,** 20 Cloudesley Square, per Alfred G. ne. One Case of Four Barbel, 27 lbs. gross weight.

6g. **GANT, J. W.,** per Alfred G. Jardine. (1) One Case Barbel, 10 lbs. (2) One Case Chub, 5 lbs. 4 oz.

6h. **SANDERS, S.,** per Alfred G. Jardine. One Case Three Gold Carp.

6j. **BENINGFIELD, ARTHUR,** per Alfred G. Jardine, 2 Cases of d Fish.

6k. **KING, G. H.,** 165 Great Portland Street. Siluris Glanis, 6 ft. 52 lbs. weight, brought by Exhibitor from Prussia. (2) Gilleroo Trout, 6 lbs. 14 oz., Lord O'Neal's Lake, Neigh, Antrim. (3) Trout from the Wandle, 1 lb. weight. (4) f Golden Tench, exhibited alive at Society of Arts in 1864. (5) Two small Jack, taken thibitor, February 28, 1883, at Mr. Albermale Cator's estate, Woodbastwick Hall, Norfolk; dead, the smaller of 9 in. attempting to swallow one of 20 in. (6) Carp with a deformed , taken from the Speaker's Pond, the Oddins, Horstead Keynes, Sussex.

7. **KNECHTLI, JOHN,** 6 Carey Lane, London, E.C. One Case of d Fish (three Pike).

8. **LAUGHRIN, WILLIAM,** Polperro, Cornwall. Sturgeon ($\frac{1}{2}$ cwt.), long.

8a. **LAYARD, J. G.,** 40 Millson Road, West Kensington, W. Case of d Trout.

9. **LEWIS, MARCUS HEDGES,** Ham, near Newbury, Berkshire. men Fish in cases, out of upwards of 4000 caught with rod and line by Exhibitor in iver Kennet. (1) Barbel, 14 lbs. (2) Chub, 5 lbs. Length, 21½ inches; Girth, 14 . (3) Pike, 25 lbs. Length, 41 inches; Girth, 20½ inches. (4) Perch, 2½ lbs. (5) 9¾ lbs. Length, 27 inches; Girth, 16¼ inches. (6) Trout, 8¾ lbs. Length, 26½ inches; 15 inches.

9a. **LOUISE, H.R.H. THE PRINCESS** (Marchioness of Lorne). rom Bermuda.

9b. **MATTHEWS, W. J.,** Railway Tavern, Hampstead Heath. Case fied Fish (various).

. **NEWBURY AND DISTRICT ANGLING ASSOCIATION,** Secretary, Mr. J. Smith, 62 Northbrook Street, Newbury, Berks. (1) A Trout ng 20 lbs., caught by the Earl of Craven in the Kennet near Newbury. (2) A weighing 18¼ lbs., caught by the Earl of Craven in the Kennet near Newbury. (3) ut weighing 10½ lbs., caught by the Earl of Craven in the Kennet near Newbury. Trout weighing 8 lbs., caught by the Earl of Craven in the Kennet near Newbury. Trout weighing 11½ lbs., presented to the Association by the late Mrs. E. Knight, and in the Kennet at Newbury. (6) A Trout weighing 8½ lbs., caught by Mr. W. Allaway Kennet at Newbury. (7) A Pike, caught in the Kennet and Avon Canal near New- (8) A Pike weighing 25½ lbs., caught by Mr. T. A. Newton in the water belonging to atterie, Esq., of Sandleford, near Newbury. (9) A Pike weighing 17¾ lbs., caught by e Mr. B. Fielder at Halfway near Newbury. (10) A Perch, caught by Mr. Clarke in nnet at Newbury. (11) A Case containing 3 Perch, caught by Mr. Clarke in the at Newbury. (12) A Perch weighing 2 lbs. 5 oz., caught by Mr. H. Dorant in the at Newbury. (13) A Perch weighing 2¼ lbs., caught by Master F. S. Cosburn in nnet at Newbury. (14) A Perch weighing 2½ lbs, caught by Mr. R. Freeman in the

*BY SPECIAL ROYAL APPOINTMENT.*

DAY, SON, AND HEWITT'S

"ORIGINAL" STOCK-BREEDER'S MEDICINE CHESTS,

FOR ALL DISORDERS IN

HORSES, CATTLE, CALVES, SHEEP, AND LAMBS.

Prices, £2 16s. 6d. and £6 6s. each, Carriage Paid.

22 DORSET STREET, BAKER STREET, LONDON, W.

Kennet near Newbury. (15) A Dace weighing ¾ lb., caught by Mr. T. Watkins in th near Newbury.

891. **MACNEE, JAMES,** Loch Tummel Side, Pitlochry, Pe Case of Stuffed Loch Tummel Trout. (12 specimens from a maximum weight of 5½

892. **MAIDENHEAD, COOKHAM AND BRAY TH ANGLING ASSOCIATION,** Skindle's Hotel, Maidenhead. Stuffed Spec Thames Fish. (1) Pike, 19 lbs., lent by Mr. A. Brinkman. (2) Trout, 10 lbs., le A. Brinkman. (3) Trout, 7lbs., lent by Mr. A. Brinkman. (4) Chub, 4¾ lbs., lent b W. J. Casberd-Boteler, R.N. (5) Trout, 7 lbs., lent by Mr. W. C. Haynes, R.N. (6 1 Tench, Perch 2½ and 2¼ lbs., Tench, 2 lbs., lent by Mr. R. Nicholson. (7) Jack, 20 by M., C., and B. Thames Angling Association. (8) Jack, 13 lbs., lent by M., C Thames Angling Association. (9) Chub, 5¼ lbs., lent by Mr. Spencer. (10) Tr lent by Mr. Worboys. (11) Chub, 5 lbs. 10 oz., lent by Mr. Worboys. (12) Perch, 3 l lent by Mr. Speechley. (13) Trout, 8 lbs., lent by Mr. H. Wilder. (14) Trout, 7 lb Mr. H. Wilder. (15) Chub, 4¼ lbs., lent by Mr. H. Wilder. (16) Jack, lent by M Lewis. (17) Jack, lent by Mr. J. A. Lewis. (18) Trout, lent by Mr. J. A. Lewis. ( 16½ lbs., lent by Mr. W. B. Lethbridge.

893. **MANN, THOMAS JAMES, Esq.,** The Grange, Bishops St Herts. (1) A Salmon Head, female, taken by rod and line. (2) A Roach, weighing from the Test. (3) A Cast of a Grayling, 2¾ lb. from the Test.

895. **MATTHEWS, EDWARD DAVID,** Member of the "West Angling Club," Windsor Castle Hotel, Hammersmith. 1 Preserved Roach in Case

896. **MATHEWS, STAVERTON,** 105 Great Russell Street, Stuffed Pike in Case, caught in the Shannon spinning by Mr. Staverton Mathews, 1878 (weight 35 lbs.)

897. **MAUDE, C. J.,** Royal Mews, Hampton Court. Three Stuffed Carp, killed in Home Park, Hampton Court, weights, 12 lbs., 11¼ lbs., 12¾ lbs.

897*a*. **MONCKTON, COLONEL F.,** Carlton Club, Pall Ma Stuffed Specimens of Barbot or Eel Pout.

898. **MOORE BROTHERS,** 36 Newsham Drive, Newsham Liverpool. (1) Skeleton of Wolf Fish, also skulls of Wolf Fish, Halibut, Hake, &c. lated and separable for purposes of study and comparison. (2) Skeleton of a Crocodile, and skeletons of young Alligator and young Edible Turtle, dissected separable for purposes of study and comparison.

899. **MORGAN, JAMES WHISSON,** 277 Amhurst Road Newington, N. Three Barbel in one Case. Total weight when caught 22 lbs. 15 ozs. (by Isaac Walton Club).

900. **MYDDELTON, SIR HUGH, ANGLING SOCIETY,** of Russia, St. John's Road, Clerkenwell, E.C. (1) One Stuffed Tench, 4 lbs. 6 oz. Stuffed Tench, 3 lbs. (3) One Stuffed Trout, 3 lbs. (4) One Stuffed Chub, 3 lbs. One Stuffed Pike Perch. (6) One Stuffed Bleak. (7) One Stuffed Pike.

901. **NALTY, T. E.,** 46 St. German's Road, Forest Hill, S.E. A Perch in Glass Case, taken on Oulton Broad, near Lowestoft, on August 27th, Exhibitor, with four smaller Perch, weighing respectively ¾ lb., 1 lb., 1 lb., and Specimen Perch 2 lb. 7 oz., total weight 6 lbs. 5 oz., taken in less than thirty minutes.

901*a*. **NESTOR, AUGUSTINE,** 33 George Street, Limerick. Brown River Trout, weight 20 lb. 13 oz.

902. **NORTH-WESTERN ANGLING CLUB,** W. Hillier, Se "Lord Southampton," Maitland Park, Haverstock Hill, N.W. (1) Nine Cases of Pi Three Cases of Chub. (3) Three Cases of Bream. (4) Three Cases of Roach. Cases of Perch. (6) One Case of Carp. (7) One Case of Reed. (8) One Case of

The Best and Cheapest. First Established 1825.

NEAVE'S FOOD FOR INFANTS AND INVALIDS

IN ONE-POUND ONE SHILLING CANISTERS.

SOLD EVERYWHERE. WHOLESALE OF THE MANUFACTURER

J. R. NEAVE & Co., Fordingbridge, England

**NG & CO.,** Fishing Rod and Tackle Manufacturers. 70 mingham. (1) Carp in Glass Case, weighing 18½ lbs., caught by Mr. J. Roach in Glass Case, weighing 3½ lbs., caught in Soho Pool, Birming-

**LL, ALFRED,** Thames Street, Kingston. (1) Stuffed Carp, weight 14 lbs. 10 ozs. (2) Stuffed Carp, taken in Home Park, when

**R, H. C.** Case of Stuffed Bream.

**ONDELEY-PENNELL, H.,** 5 Cadogan Terrace, S.W. eighing 53 lb., taken in the Avon at Christchurch, April 3, 1880, and st caught in that river within memory. It was presented to their Parlia- hn E. Edwards-Moss, Esq., by his supporters, and the cast now exhibited arle. (3) Pictures of Fish. These pictures are taken from specimens alities most celebrated for the particular species, and are literally drawn re examples of the illustrations of "British Sporting Fish," about to be bitor.

**RDT, G.,** Working Naturalist, 45 Crogsland Road, London, ction of Stuffed Fish, Reptiles, Birds hostile to Fish, and Mammalia, ll in two glass cases.

**ROBERT L.,** 16 Comeragh Road, West Kensington, W. e Kennet, twelve fish, weight 32 lbs. (2) Trout from Thames, one fish, h from Kennet, five fish, 12 lbs. 7 oz. (4) Perch from Kennet, five fish, erch from Thames, two fish, 3 lbs. 14 oz. (6) Four Cases of Barbel, k, from Thames, taken with the worm, 10 lbs. 8 oz. (8) Jack, from he worm, 12 lb. 8 oz. (9) Chub, taken on single-hair line in the Thames z. (10) Chub from Thames, 4 lbs. 11 oz. (11) Tench from Thames, (12) Dace, from Thames, one fish, 11½ oz. (13) Dace, from Kennet, six 4) Dace, from Kennet, two fish, 1 lb. 8 oz. (15) Dace, from Kennet, one ope, from Thames, 3½ oz. All the above were taken, with rod and line, years.

**IG AND DISTRICT ANGLING ASSOCIATION,** Reading. Cast of Salmo Fario, in show case, caught at Reading, April to H. M. the Queen. The cast prepared by the late Frank Buckland.

**ORIAL SOCIETY,** Ashley's Hotel, Covent Garden. James 1) Three cases of Pike, weights 25 lbs., 21 lbs., and 20 lbs. (2) Eleven s, 10 lbs. 8 oz., 10 lb. 8 oz., 8 lbs. 8 ozs., 8 lbs. 4 ozs., &c. (3) Six cases bs. 4 oz., 5 lbs. 4 oz., 4 lbs. 4 oz., 4 lbs. 2 oz., and 4 lbs. 2 ozs. (4) Four hts, 3 lbs., 3 lbs., 2 lbs. 8 oz., and 2 lbs. 4 oz. (5) Five cases of Roach, 2 lbs. 6 oz., 2 lbs. 4 oz., 2 lbs. 1 oz., 2 lbs., and 1 lb. 14 oz. (6) Three cases z., 4 lbs. 3 oz., and 3 lbs. 7 oz. (7) Three cases of Tench, 4 lbs. 12 oz., . (8) One case Carp, 5 lbs. 12 oz. and 5 lbs. 4 oz. (9) Three cases of and 6 lbs. (10) Two cases of Dace, 16 oz., 15 oz., and 14 oz. (11) Two lbs. and 1 lb. 13 oz. (12) One case of Prussian Carp, 3 lbs. 15 ozs. rr, the two, 1 lb. 8 oz. (14) One case of Flying Fish. (15) Case of Cast of Pike by Frank Buckland, painted by the late H. L. Rolfe, weight ving Cup of the Piscatorial Society.

**IOND PISCATORIAL SOCIETY,** East Sheen, Surrey; ty. Fifteen cases of Stuffed Fish.

**TS, THOMAS,** Castle Meadow, Norwich. (1) One Case Roach. (2) One case with small Pike and Water Rail.

**SON, A., & LOWIN, B. J.,** Edmonton and Tottenham per Edmonton, Middlesex. (1) Perch 4 lbs. 4 oz. (2) Pike, 4 lbs.

**lemen's Ventilated Waterproofs**

**D, CASHMERE, GOSSAMER, AND OTHER MATERIALS.**

**RSON, ABBOTT, AND ANDERSON,**

INDIA-RUBBER MANUFACTURERS,

**EEN *VICTORIA* STREET, LONDON, E.C.**

**911*a*. ROSS, CAPTAIN,** 174 Cromwell Road, South Kensington. (1) Case of Perch. (2) Case of Roach.

**912. SACHS, ALICE,** 22 Hyde Park Place, London, W. C Salt-water Fish.

**913. SACHS, FLORENCE,** 22 Hyde Park Place, London, W. (1 cular Model of Three Trout. (By the late Frank Buckland.)

**914. SACHS, THOMAS RANSOM,** 22 Hyde Park Place, Lond (1) Twenty Glazed Cases, containing Stuffed Fish, Trout, 2 lbs. to 12 lbs., Fresh Water Char, Knife Fish, Pike, Perch, 4½ lbs., Perch, 3¾ lbs., 2¾ lbs., Bream 6 lbs., Fi American Striped Bass, Black Bass, and Cast of a Trout.

**916. SCOTT, J. R. KNOWLE,** F.S.A., The Drive, Walth Specimen of a Large Pike, in glass case, caught with a rod at Avon Tyrell, in Ha River Avon, weight 32 lbs., 3 feet 8 inches in length by 28 inches in extreme girth.

**917. SEARLE, EDMUND WILLIAM,** 11 College Place, Great Street, N.W. (1) 53 lb. Salmon, cast and painted to life. (2) 17 lb. Thames Tr cast and painted to life. (3) Group of fifteen Common Trout in case, cast and p (4) Two large 6 lb. Soles, cast and painted to life. (5) Dish of Sea Trout caught Bridge, cast and painted to life. (6) Dish of Common Trout, cast and painted Large 3 lb. Lampern, cast and painted to life. (8) Several small Salmon, cast and p life. (9) Five 2 lb. Perch, cast and painted to life. (10) Two Mackerel, 1 lb. and and painted to life. (11) Grayling cast and painted to life, and various other eatings specimens of the following Exhibits are the work of E. W. Searle;—**886.** Cast of L **905.** Cast of 53 lbs. Christchurch Salmon; **908.** Cast and coloured, 16 lbs. 15 oz. Thame **945.** Cast and coloured 43½ lbs. Salmon; also the greater part of the specimen Buckland Museum.

**917*a*. SILVER TROUT ANGLING CLUB,** Star and Garter H St. Martin's Lane, W.C. 54 cases of Fish.

**918. SMITH, D.,** 16 Guildford Street, Wilmington Square, Clerke (1) Two large Perch, weight 3 lbs. 12 oz., taken at Amberley. (2) Three large Perch Colne. (3) One Carp, River Wey. (4) One Roach, weight 1 lb. 14½ oz., taken at A (5) One Roach, weight 1 lb. 13½ oz., taken at Amberley.

**918*a*. SMITH, E. H.,** 22 Strutton Ground, Westminster. Case cont three Brook Trout.

**919. SNOWIE, HUGH, & SONS,** Church Street, Inverness. (1) Ferox Trout taken in River Ness. 29½ lbs. In glass case. (2) Salmo Ferox Tro Loch Ness. 7½ lbs. In glass case. Killed with a Minnow. (3) Gilleroo Trout late Duke of Leeds at Applecross. Weight 10 lbs. On stand.

**920. SOCIETY OF CAXTONIAN ANGLERS, THE,** Falcon Gough Square, Fleet Street. (1) One Case Three Bream. (2) One Case Three One Case Two Jack. (4) One Case One Jack. (5) One Case Two Bream. (6) One Barbel. (7) One Case One Chub. (8) One Case One Jack. (9) One Case One Jack One Case One Bream. (11) One Case One Carp.

**922. SQUIRE, FREDERICK W. W.,** 13 Radnor Place, Plymouth large preserved Specimen of Cornish Brown Trout (Salmo faris), weight 5 lbs. 10 oz.

**923. STANLEY ANGLERS' SOCIETY,** 51 Camden Park Road, N Geo. E. Walker, Hon. Sec. A Collection of Stuffed Fresh-Water Fish.

**924. STARKEY, JAMES,** 28 Albion Road, Stoke Newington. Case (1) Ten Roach, united weights 16 lbs. (2) One Carp, weighing 5 lbs. 2 oz. (3) One C weighing 5 lbs. 11 oz. (4) Two Tench, weighing 4 lbs. 6 oz. (5) Two Perch, weighing 6 oz. (6) One Trout, weighing 8 lbs. 7 oz. (7) One Trout, weighing 7 lbs. 12 oz. Trout, weighing 9 lbs. 2½ oz. (9) One Bream, weighing 8 lbs. 7 oz. (10) One

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g 4 lbs. (11) One Jack, weighing 10 lbs. (12) One Jack, weighing 12½ lbs. (13) k weighing 13 lbs. (14) One Jack, weighing 17½ lbs. (15) One Roach, weighing 2¾ 6) Two Trout from the River Leader.

. **STURGISS, Mc.,** 113 Westbourne Park Road, Hyde Park. Thames

**SOUTH LONDON ANGLING SOCIETY.** Cases of Stuffed ater Fish.

. **SWEETING, JOHN, & CO.,** 158, 159 Cheapside, London, E.C. ll Sturgeon. (2) Irish Trout.

**TAPLIN, F.,** Wimbledon. (1) Two Carp in Case, each weighing 3 lbs., not caught by Exhibitor. (2) Carp in Case, weighing 13½ lbs.

**TAYLOR, GEORGE GALLOWAY,** 11 Tranton Road, Jamaica ermondsey, S.E. Chub, weight 7 lbs., caught in the Thames on the 14th August, 1881, the papers at the time, to be the largest preserved in the United Kingdom.

**TAYLOR, MATTHEW,** Cookridge Street, Leeds. One Show Case, ng coloured casts from fish (chiefly fresh-water fish).

. **TEASDEL, W.,** Harbour Works, Great Yarmouth. Stuffed Eel.

**TOPPIN, PERCY,** Glan-yr-Afon, Strawberry Hill. Two Cases of d fish "Bull Trout," weight 27 lbs. and 30½ lbs. each, caught by Exhibitor while fishing and with flies of his own make. The fly which caught the larger fish was lost eavy fresh run salmon estimated at over 40 lbs. weight, after a most exciting fight in e pool half an hour later.

. **TRAQUAIR, R. H.,** 8 Dean Park Crescent, Edinburgh. Draw- Fossil Fishes from British Carboniferous Rocks.

**TREMAINE, WILLIAM HENRY,** Member of the West Angling Club, Windsor Castle Hotel, Hammersmith. One Preserved Pike, weight in case, caught in the River Ouse.

**UNITED SOCIETY OF ANGLERS (THE),** The "Wellington," tch, E. Loan Collection of Stuffed Freshwater Fish, 80 cases.

**EDINBURGH, H.R.H. THE DUKE OF, K.G.,** Clarence St. James's, London. Pike, 28 lbs.

**VALE, JOHN,** 27 Hammersmith Road, London, W. (1) Case ng Pike, weight 27 lbs., caught by Rod and Line. The thickness of the back of ce is something extraordinary; was caught "spinning" in the adjoining lake inia Water, in Windsor Park. (2) Case containing Thames Trout, weight 7 lbs., at Maidenhead.

. **WATKINS, C.,** Woolwich Invicta Angling Club. Case of large Perch.

**WEBB, T. S.,** 56 Burton Street, Burton Crescent, London. of King's Cross United Angling Society. (1) One Trout, 16 lbs. 5 oz., in Bent Case, y rod and line, New River. (2) Two Trout, 8 lbs. 9 oz., and 6 lbs. 12 oz., in Square aken by rod and line, River Lea.

. **WHALE, J.,** 74 Leadenhall Street, E.C. (1) Samples of Hippo- s Teeth. (2) Samples of Rhinoceros Horns. (3) Samples of Whales Teeth. (4) s of Walrus Teeth. (5) Two Hippopotamus Heads. (6) Samples of Sawfish. (7) s of Dugong Bones. (8) Samples of Norwhal Horns.

**WEBSTER, WILLIAM GEORGE,** 1 Bedfort Court, Old Street, Red Lion Square, W.C. (1) Two Stuffed Roach, in Case, 4 lbs. 3 oz., taken at ey. (2) One Stuffed Roach, in Case, 2 lbs. ½ oz., taken at Amberley. (3) One Roach, in Case, 1 lb. 9½ oz., taken at Amberley. (4) One Stuffed Roach, in Case, oz., taken at Amberley. (5) Two Stuffed Roach, in Case, 3 lbs. 5 oz., taken at

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PRIZE MEDALS, 1851, the only award out of 25 Exhibitors.

15, FETTER LANE, LONDON, E.C.

Amberley. (6) One Stuffed Roach, in Case, 1 lb. 2¾ oz., taken at St. Margaret's. (7) T with Particulars of Fish.

935*a*. **WEST, DAVID W.** (1) Sea Porcupine. (2) Shark's Jaws. bones of shark, measuring 20 ft. long, which was caught in the Persian Gulf by C Macdonald and crew of the "Countess of Cantore" in March, 1879. The stomach shark was found to contain a man's foot enclosed in a lace-up boot.

936. **WESTBOURNE PARK PISCATORIAL SOCIETY,** T "The Pelican," All Saints' Road, Near Westbourne Park Station, London, W. H. Thor Secretary. (1) Pike in Case, 26 lbs. from private water. (2) Pike in Case, taken in Junction Canal. (3) One Pike in Case. (4) Trout in Case, Thames. (5) Barbel in Thames. (6) Carp, Welsh Harp. (7) Carp, Welsh Harp. (8) Bream, Ouse. (9) Colne. (10) Pair of Tench, private water. (11) Perch, Kennet. (12) Roach, (13) Roach, Colne. (14) Dace, Colne. All fish taken angling.

936*a*. **WHITE, F.** Stuffed Dace.

937. **WILLIAMS, F. T. & CO.,** Great Queen Street, London. (1) containing three Perch. (2) Case containing one Bream.

938. **WOODMAN, G.,** Vice-President of the Junior Piscat Society, 60 Camberwell New Road. (1) One Case of Rudd, caught with rod and line Four Rudd, all over 2¼ lbs. each.

938*a*. **WOODROW, A.** Large Stuffed Chub.

939. **WRIGHT, ROBERT,** The Willows, Harlesden, Middlesex. Grayling in Case, weight of fish, 3 lbs., caught with fly.

940. **WYNN, SIR WATKIN W., Bart, M.P.,** Wynnstay, Rhus Specimens of Stuffed Fish called Gwynyad from Bala Lake, North Wales.

941. **FITZGERALD, MAJOR PUREFOY,** North Hall, near Ba stoke. Stuffed Pike, caught at Upton House, Edge Hill, in an old monastic pond; l 4 ft. 1 in.; circumference, 2 ft. 5 in.; weight, 40 lbs.

942. **GARDNER, JAMES,** 29 Oxford Street, London, W. Show Ro 149 Oxford Street, W. Collection of Stuffed Fish, consisting of various Fresh and Salt-W Fish, Molluscs, &c.

943. **BRAINE, FRANK,** Kensington. Stuffed Pike, Stuffed Bream.

945. **SCOTT, HARRY,** Forbes House, Surrey, 28 Belgrave Sq Cast of Salmon, weighing 43½ lbs., caught with fly on the Culter House Water, Dee, Aber shire, by H. Scott, and painted by Mr. Searle at the house and under the personal super of the late Mr. Frank Buckland.

946. **WEBB, JOHN W., CAPTAIN R.N.,** Kongo House, Hytha very large Snout of Sword-Fish, obtained at Singapore; the fish was probably caught i Straits of Malacca, and it is believed to be larger than any in the British Museum.

947. **ADAMS, W. A.,** Gaines, Worcester. Stuffed Pike.

948. **BURTON & SON, H. J.,** 191 Wardour Street, Oxford St London. Group of Saw-fish snouts. Also a large stuffed specimen of the Sturgeon, Crocodile Head.

DIVISION LII.—[*East and West Quadrants.*] *See Plan, p.* 102.

(I) Reptiles, such as tortoises, turtles, terrapins, lizards, serpents, frogs, newts, &c.

950. **BRIGHTON AQUARIUM COMPANY.** Turtle.

951. **BUTT, GEORGE F.,** 49 Wigmore Street, London, W. Ind Crocodile (C. bombifrons) stuffed in case, in the act of seizing a Leopard (Felis Leopar while drinking.

953. **BURTON & SON, H. J.,** 191 Wardour Street, Oxford Street, Lond Turtle Shells.

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a. **DREEVAR, GEORGE,** 78 Wells Street, Oxford Street, W. (1) Snake taken in Indian Ocean. (2) Flying Fish taken more than 100 years ago on ck of a vessel of the Royal Navy by the late Admiral Lechmere, formerly Capt. of Thunderer. (3) Specimen of Common Indian Ring Snake.

a. **LIGGINS, MRS. HENRY,** 3 Ladbroke Square, W. Polished Shell.

b. **GUNN, T. E.,** 47 St. Giles Street, Norwich. Collection of British Reptiles, consisting of Frogs, Natter Jack and Common Toads, &c., caught Norwich. These include a remarkable monstrosity of a Toad having five distinct and med legs; it was taken alive at Cossey, near Norwich, in May, 1882.

DIVISION LIII.—[*East and West Quadrants.*] *See Plan, p.* 102.

(m) Aquatic and other birds hostile to fish or fishing.

c. **AMHERST, MRS. MARGARET,** 88 Brook Street, Grosvenor W. Heron and Eel in case.

5. **ASHMEAD, G. B., & CO.** (Naturalists), 35 Bishopsgate Street, E.C. (1) Marine Fish-feeding Birds. Divers, Cormorant, Shag, &c. (British). (2) Fish-feeding Birds. Heron, Bittern (British). (3) Small groups, anecdotal, ating vicissitudes of bird and fish life; also preserved bird skins, from which artificial sed in fishing are formed.

6. **BARTLETT, A. D., & SON,** Zoological Gardens, Regent's Park, Fish-eating Birds—(1) Squaco Heron. (2) Buff-backed Heron. (3) Penguin. ing Fishers.

7. **BURROUGHS,** Lieut.-Gen. **F. W. TRAILL,** C.B., Rousay, N.B. Two Stuffed Wild Swans shot in Rousay, Orkney, N.B.

8. **EEDLE, THOMAS,** 40 Goldsmith Row, Hackney Road. Birds us to Fish—(1) Goosanders. (2) Kingfishers. (3) Dippers—Birds beneficial to

9. **FRASER, SIMON,** 11 Huntly Place, Inverness, N.B. (1) Glass f Aquatic Birds, general. (2) Case of Birds in act of destroying Trout in artificial

1. **GUNN, T. E.,** 47 St. Giles Street, Norwich. (1) Collection of Stuffed Birds hostile to fish and fishing contained in about 40 cases, including fine specimens Osprey, Kingfishers, Herons, Night Heron (very rare), Bitterns, White Stork, Egret, bill, Water Hen, Coot, Shieldducks, Shovellers, Scoters, Smew, Goosander, Meyauser, Crested and other Grebes in summer and winter. Divers, Guillemots, Razorbill, Little Puffin, Cormorant, Gannet and various species of Terns and Gulls, nearly all collected folk, and mounted in groups illustrative of different seasons, and also some remarkable ts in Aquatic life, the whole forming a representative series of British Fish-Eating

2. **HELSTRIP, C.,** 13 St. Saviour's Place, York. (1) Osprays and Fish. lle Egret. (3) Darters. (4) Night Herons. (5) Ruddy Sheldrake and Duck. (6) Duck and Drake.

3. **HODGES, W. J.,** Aucuba Villa, Lavender Hill, S.W. (1) Gannet or Goose. (2) Heron. (3) Black-throated Diver (winter plumage). (4) Green ant. (5) Great Black-backed Gull. (6) Herring Gull. (7) Herring Gull (immature). Common Gull. (9) Red-legged Gulls (winter plumage). (10) Red-legged Gulls plumage). (11) Guillemots. (12) Razor-bill. (13) Puffins. (14) Oyster Catcher. urlew. (16) Curlew. (17) Curlew. (18) Whimbrel. (19) Grey Plovers (winter ge). (20) Bar-tailed Godwits. (21) Greenshanks. (22) Greenshank. (23) nk. (24) Spotted Redshank. (25) Stints. (26) Teal, female. (27) Green Plover. Sandwich Tern. (29) Little Tern. (30) Sooty Tern. (31) Common Tern.

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EBONITE
WATERPROOF
BLACKING,
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964. **HOWLETT, W.,** High Street, Newmarket. Five Cases Bi hostile to Fish:—(1) One Case with two Birds, Purple Herons. (2) One Case two Bi Common Heron. (3) One Case one Bird, Gannet. (4) Two Cases of Kingfishers, two B in each case; all shot on Norfolk and Suffolk Coast.

965. **JARDINE, ALFRED GEORGE,** 38 Old Change, Lond (1) Case of Birds. (2) Red Throated Divers. (3) Winter Plumage.

966. **ROBERTS, THOMAS,** Castle Meadow, Norwich. Cases Stuffed Aquatic Birds.

967. **SACHS, THOMAS RANSOM,** 22 Hyde Park Place, London, Two Cases, containing German and English Kingfishers.

967*a*. **SILVER TROUT ANGLING CLUB.** Case of Aquatic Birds.

968. **SNOWIE, HUGH, & SONS,** Church Street, Inverness. (1) Ma and Female Great Northern Diver, 16 lbs. (2) Two Cormorants, 18 lbs. (3) One Red throated Diver, 7 lbs.

969. **BURTON, H. J., & SON,** 191 Wardour Street, Oxford Stre London. (1) Case of Ducks, stuffed and mounted. (2) Case of Waders, stuffed and mounted (3) Case of Ducks, stuffed and mounted. (4) Group of two common Terns in glass shade (5) Case of Sea-fowl, stuffed and mounted. (6) Case of Water-fowl, stuffed and Mounted (7) Case of Gannets (adult and young birds), stuffed and mounted. (8) Case of Water stuffed and mounted. (9) Case of Cormorants, stuffed and mounted. (10) Case of Cormorants stuffed and mounted. (11) Glass Show Case of Aquatic Bird Skins.

970. **BUTT, GEORGE F.,** 49 Wigmore Street, London, W. (1) Contes between two Osprey (Pandion haliœtus) or Fish Hawks, over a Lump Fish (Cyclopterus lumpus), in case. (2) Two white Spoonbills (Platalea Leucorodia) at rest, with marine acce sories—fish, &c.—in case.

971. **COOKE, T., & SON,** Naturalists, 30 Museum Street, W. (1) Ca of Kingfishers. (2) Mahogany case of two Divers. (3) Case with Heron. (4) Case w Gannet. (5) Two cases of Eggs.

972. **GARDNER, JAMES,** 29 Oxford Street, London, W. Show Room 149 Oxford Street, W. Collection of Aquatic Birds, consisting of various species of Herons Gulls, Divers, Ducks, Pelicans, Storks, Cranes, Albatross, Grebes, &c.

DIVISION LIV.—[*East and West Quadrants.*] *See Plan, p.* 102.

(*n*) Aquatic and amphibious mammalia (otters, seals, whales, &c.) and others detrimental to fish.

973. **ASHMEAD, G. B., & CO.** (Naturalists), 35 Bishopsgate Stre London, E.C. (1) Marine Mammals; Seal. (2) Aquatic Mammals; Otter.

974. **CARR, WALTER PATERSON,** High Street, Berwick-on-Twee An otter (stuffed), caught along with Salmon in net in River Tweed.

974*a*. **COCKS, A. HENEAGE.** Skeleton of an Otter.

975. **EASTWOOD, G. J.,** Cheshunt, Herts. Otter, shot in the Exhibitor' private Fishery, weight 13½ lbs.

976. **EEDLE, THOMAS,** 40 Goldsmith Row, Hackney Road, London Otters and young.

977. **EYRE, HENRY BINFORD,** Elgin Lodge, Weybridge. (1) Bitch Otter and Young in glass case. (2) Dog Otter in glass case. (3) Bitch Otter with Fish in glass case.

979. **GUNN, T. E.,** 47 St. Giles Street, Norwich. (1) Two Groups of Stuffed British Otters are shown as aquatic animals detrimental to the fishing interest. (2) "At Bay" represents a fine dog of 26 lbs. weight, with a roach of 2¼ lbs. under its foot, and its alarmed young ones around; it is supposed to have been tracked to its home by the

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ds. (3) "Night Poaching" shows a brace of otters, regaling themselves upon the finny bitants of a trout stream. (4) A Small Case, containing a Baby Otter, about two days taken near Norwich.

79*a*. **PUGH, ROBERT L.**, 16 Comeragh Road, West Kensington, W. r from Thames.

79*b*. **ROBERTS, THOMAS**, Castle Meadow, Norwich. One Case, Pair tters and Fish.

79*c*. **LEE, HENRY**, Margate. (1) Rostrum, or "Horn," of Narwhal. Rostra of Saw Fish.

79*d*. **REEVES, ROBERT W. C.** One large Seal taken in the Shannon Kilrush.

80. **HELSTRIP, C.**, 13 St. Saviour's Place, York. Otters and Fish.

80*a*. **SILVER TROUT ANGLING CLUB.** Otter in case.

81. **WILLIAMS, ALEXANDER**, 97 Victoria Road, Dundee, Scotland. Large Stuffed Walrus, captured by Captain Adams, Dundee (2) Eskimo Clothes. Five Stuffed Seals. (4) Three Saw Fishes. (5) Porpoise Fish.

81*a*. **NEWBURY ANGLING ASSOCIATION.** Otters from the net.

DIVISION LV.—[*East Quadrant.*] *See Plan, p.* 102.

**rks of Ichthyology. Maps illustrating geographical distribution, migration, &c., of fishes and spawn.**

82. **DAY, Dr. FRANCIS**, Leamington House, Cheltenham. (1) 2 Vol. Fishes of India. (2) 6 No. 8vo., Fishes of Great Britain. (3) 2 Vol. 8vo., Fish and eries of India. (4) 1 Vol. 4to., Fishes of Yarcand.

84. **HOUGHTON, REV. WILLIAM**, M.A., F.L.S., Preston Rectory, ington, Shropshire. Book, in two Volumes, "British Fresh Water Fishes."

85. **LAUGHRIN, WILLIAM**, Polperro, Cornwall. A paper on the th of Barnacles on ships' bottoms and logs of wood found floating on the ocean.

86. **QUARITCH, BERNARD**, 15 Piccadilly, London. (1) Illustrations Salmonidæ, by Sir William Jardine, twelve coloured engravings, in twelve frames. (2) ations of Fresh Water Fishes, by Louis Agassiz, twenty coloured engravings, in twenty s. (3) Walton's Angler, first edition, 1653, a reproduction in facsimile by W. Griggs.

DIVISION LVI.—[*East and West Quadrants.*] *See Plan, p.* 102.

**imens and representations illustrative of the relations between extinct and existing fishes.**

. **GALLOWAY, WILLIAM**, Inveresk by Edinburgh. Collection of interesting objects from a pre-historic shell-mound, in the island of Oransay, Western es. This shell-mound is situated on the old coast line, and dates undoubtedly from a anterior to its elevation. No trace of metals have been found, but the occurrence of us flint chips, &c., carry it back evidently to the neolithic age. Of objects, showing kable traces of human use and agency, there are ten fish-spear or harpoon heads of nd one butt; also numerous rubbed bones, chisels, borers or awls, and picks of the aterial. Also lap and hammer-stones, rubbed stones, limpet hammers, &c. Also shells, evidently trimmed for use as spoons, pierced for suspension, &c In addition to al edible shellfish, the shells of which occur in large quantities, there are also remains Rorqual, Seal, Red Deer, Otter, and other mammals; of the Mullet, Wrasse, picked , Skate, &c. Among the aquatic birds are included bones of the now extinct Great e Wild Swan, Razorbill, Guillemot, &c., forming one of the most important discoveries kind made in Scotland. (2) Various relics from a Viking grave in Kiloran Bay,

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Colonsay. This grave was accidentally discovered by Malcolm McNeill, Esq., of Colons June, 1882, and, from the number of clinker-nails or rivets found, has evidently been a sh burial. In addition to human remains, there were found iron weapons, very much oxidised, cluding a sword, spear, and battle-axe; also remains of a shield; iron pot, &c. Portions of a bronze belt, bronze pin, and a very perfect set of scales and weights, &c.

990. **GERRARD, EDWARD, JUN.**, 31 College Place, Camden To (1) Skeleton of Cod. (2) Skeleton of Maigre or Royal Fish. (3) Skeleton of Cera Forsteri. (4) Skeleton of Hake. (5) Disarticulated Cod's Head. (6) Tortoise Skeleton

991. **GREGORY, JAMES R.**, 88 Charlotte Street, Fitzroy Sq London. (1) Collection of Fossil extinct British Fishes, with names, geological form and localities. (2) Collection of Fossil Teeth of extinct British Fossil Fishes, with n geological formations, and localities.

991*a*. **LEE, HENRY**, Margate. (1) Skeleton of Porpoise, a fish Mammal, recent. (2) Skeleton of Ichthyosaurus, a fish-like Reptile, fossil. (3) Mod Ichthyosaurus and Plesiosaurus. (4) Vertebræ and Teeth of Sharks.

991*b*. **NATIONAL INDUSTRIAL HOME FOR CRIPPLED BO** Wright's Lane, Kensington. Case containing seaweeds, fish, books, fossils, &c.

992. **NICHOLS, EDWARD**, Market Place, Norwich. Jaw Bones teeth of Roach, caught and mounted by Exhibitor.

993. **MANTUA AND MONTFERRAT, H.M.S.H. PRINCE** 16 Elgin Road, St. Peter's Park, W. (1) Historical collection of fossil-fish, with recent for comparison, comprising specimens from the collection of Ulysses Aldrovandi, the fath Ichthyology, who lived at Bologna in the 16th century, and placed by him in the museum at the Ducal Palace at Mantua. It contains also specimens from the collecti Korr, author of the 'Petrificata,' Professor Louis Agassiz, Baron George Cuvier, Miss Anning, of Lyme Regis, Dean Buckland, Baron Alexander von Humboldt, Hugh M William Smith, father of English Geology, the Rev. W. Conybeare, the Rev. Adam Sedg Sir C. Lyell, Sir R. Murchisson, and includes many figured specimens; shows also the medals given by the Council of the Mantua and Montferrat Medal Fund to the Ba Enniskillen, Professor Richard Owen, Professor Agassiz and others for Ichthyology or Sci (2) Red Crag, Walton-on-the-Naze, about 380 species collected in zones of age by the Pr assisted by General J. J. Jenkins, Mr. Percy F. Kendall. Mr. W. H. Taylor, and Mr. P Brocas during 1880 and 1882, named by Mr. Robert Bell, F.G.S., and Mr. P. F. Kendall includes many species new to the Red Crag, or to the locality at Walton; the largest most complete collection ever made in this place. (3) General Collection of Fossil C including many types figured in the "Paleontographical," and arranged and named Mr. R. Bell. (4) Recent and Fossil Sponges, principally British, for comparison. (5) Re and Fossil Starfish, for comparison. (6) Recent, and Fossil Sea Eggs, for comparison. Br and Foreign. (7) Eggs of Crocodiles, Tortoises, Snakes, Lizards, Fish and Molluscs, shells of the animals that laid them, collected by Dr. David Livingstone, &c. (8) Ca Resemblances to Human and Animal Forms, writings, alphabets, so-called "mimicries animal and plant life, as seen on fossil sponges, shells, Egyptian pebbles showing portrai well-known individuals, rocks and seeds, all natural. Letters of Hebrew, Greek, Sa Arabic, natural on objects. (9) Seaside Plants, particularly monstrosity of sea beet. Rare Recent Shells from Doggerbank, collected by fishermen. (11) Conchology, recent collection of genera and important species, named by Mr. Robert Bell. (12) Peruvian historic Relics of Fishermen, including fishing-nets, implements for making the same, speci of garments and weaving implements, food, mummies of pet animals, ornamental dress, with figure of fish-god and sundries, illustrating their lives. (13) A General Collection Fossils, principally marine. (14) Fossil Shells collected in two hours in the quar Parnes, near Paris, Middle Eocene. (15) Collection of Amine Fossil Copal, from the ba of the east coast of Africa, showing fossil insects, a lizard, flowers, leaves, all embalmed amber, with recent insects for comparison. (16) Recent and Fossil Corals for comparison.

COPY OF TESTIMONIAL GIVEN RESPECTING

**ANDERSON, ABBOTT, AND ANDERSON'S**

REGULATION ARMY WATERPROOF CLOAK.

HEAD QUARTERS, R.V.C., BERWICK-UPON-TWEED, *May 28, 1877.*

GENTLEMEN,—I have sent the Regulation Cloak that I purchased from you some five or six years ago. Will you have the goodness to put a new collar on it, and return to me.

In justice to yourselves I ought to mention that the cloak in question has seen a good deal of rough work, and with the exception of the collar is not very much the worse.—Yours obediently,

(Signed) ROBERT WEDDELL, CAPTAIN, 1st. B., R.V.C.

Messrs. ANDERSON, ABBOTT, and ANDERSON, Queen Victoria Street, London, E.C.

TORY AND LITERATURE OF FISHING—FISHERY LAWS—FISH COMMERCE.

tory and literature of fish and fisheries form in themselves a veritable ocean, the its of which are of the most varied nature, from the chatty pages of Walton to the it scarcely inviting Tables of Parliamentary Statistics. This voluminous treatment sion surprise to persons unacquainted with the extent and intricacy of the subject; cause will be readily perceived by any one who considers the complexity of the involved, as well as the multiplicity of species and properties. Not merely do fish e of the chief staples of human food, but they are the only denizens of the element ers by far the greater portion of the earth's surface. When to these considerations it that they are apparently quite incapable of domestication, that some of the finest dwindle and die out unless a perfectly free course be opened to them through river , that their capture is the source of innumerable jealousies, and that physical means ly be devised for protecting piscatorial rights whether vested in communities or indi- e wonder arises not that so much has been written, but rather that there should be any ntroversy. Fishing, whether for business or pleasure, is considered by English d indeed by mankind in general, as primarily a pursuit in which all the world may herever, whenever, or however they please; and the only limitations to its exercise r origin either in a defective right of access to the waters or in the necessity to continuance of supply. Thus on the high seas every one may catch whatever fish with whatever means they are able to employ, so long, of course, as they do not inter- the superior right of navigation. On the other hand, it is clear that when a coast is d, certain rights over the adjacent waters must naturally belong to the people of ry; so that foreigners cannot exercise their occupation within some conventional three miles from low-water mark in the point determined) without licence from ment. Hence arises immediately the necessity for international agreement, and earliest conventions between Great Britain and the newly acknowledged American d regard to the fisheries of Newfoundland. Direct piscatorial rights, too, are by the only objects of diplomatic intervention in these matters; and not many years ed since the position of seamen in distress, and the distribution of their estates, eased, became regulated by Treaty between our own Government and those respec- Germany and Italy. Rivers, again, in so far as they are navigable, are open to all the country through which they run; but where access can only be obtained from the h they and the fish contained in them are considered to belong to the riparian pro- Angling, it may be here observed, stands upon precisely the same footing as net cept that the open season is protracted for a short time in order to balance in some nights and unfavourable days during which nets only can take effect, and that with the rod are liable to rather lighter fines. The duration of the period during ing is prohibited for fear of injury to the spawn, has caused endless discussion and ; while the construction of wears or weirs has been a fertile source of dispute days of Magna Charta at the very least. The regulations upon these subjects ther miscellaneous, not to say conflicting, and vary both with the species and the Salmon indeed, like the house of Courtenay, is so lordly in its nature, and so migra- habits, as to require nothing less than a chapter of history all to itself. But the aid to have been introduced into England by Cerdric, in the days of Romulus us, can boast of a lengthened pedigree, and the royal whale lays claim to no slight tion. In fact, if any one desired to become familiar with the history of this extensive the animal kingdom, it is necessary that he should acquaint himself not only with ts and habits of the fish, but also with the Treaties, Charters, Acts and Regulations, the original freedom of universal piscatory has been abridged in accordance with nal, municipal, or special declaration. The theme is by no means dry or wanting glimpses of national character which give colour to historical research. In classic atorial rights, both public and private, were commonly recognised, as is shown by ons of satirists, and the numerous technical terms in use. At Pompeii, for example, argue from the frescoes still extant upon the walls, angling must have been a very employment. *Amongst our own* ancestors, the Anglo-Saxons fed largely on fish, but

the Britons are said to have refrained from them out of reverence for streams and rivers the alleged aversion of certain large classes of the poor to this article of food may possibly a survival of this notion. In the Venetian edition of the Older Salic Law, a fine is en of "MD. Denarios, XV. Solidos" for the theft of a fish. Feudalism developed the pa private ponds of great seigneurs to a most elaborate extent, and the Fifth Book of Ordonnances of Louis XIV. enters into very minute particulars. The Code Rurale also lished by Royal Privilege in 1775, contains many interesting details of a system swept a few years afterwards, like so many other remnants of Feudalism, by the force of the R lution, in which so conspicuous a part was played by the Dames de la Halle. For comparative freedom with which our own arrangements have been conducted we are pri indebted to the existence of the celebrated Fishmongers' Company, or "Mistery of Fi mongers," to use their ancient title. The charters of this wealthy and famous Society us back as far as Richard II. The amalgamation of the two Guilds of Stockfishmo and Saltfishmongers took place in the times of the Roses: their Common Seal still the cross-keys of their patron the Fisherman; and the Fire of London is an event of y terday in their annals. Other nations may have established a commerce as extensive remunerative, but seldom has such a commerce been enjoyed for so long a duration. Of foreign rivals of the Company—domestic they had none—by far the most formidable from the sea-loving country of Holland, which at one period almost succeeded in taking whaling trade out of British hands. A manuscript in the Harleian collection, bearing 1632, contains "A discoverie of the Hollanders' Trade of Fishinge, and the circumstan therein; the means how to make a profitt of the fishinge, by which they have made and doe reape soe greate a benefitt, with the profitt, honor and securitie that will redounde Ma^tie and all sorts of subjects within his Ma^ties three kingdomes by it. Written by Sr. Munson, Knt., sometyme Vice Admiral of England, and now in agitation togeather with his Letters Pattents for the Execution of the same." Ninety years later a Report upon the of the Greenland fishery was drawn up by order of Sir John Eyles, Governor of the South Company. Of the high value placed upon the trade as regarded both from the political the commercial point of view, the following passage will enable us to judge: "Is it expected," says the author of the Parliamentary History, discussing the proceedings of Scottish Parliament relatively to the Union, "that Holland will suffer us to improve Fishery, which is their nursery for seamen, a livelihood to many families, and an im treasure to the public?" Such are some of the incidents which illustrate and enliven characteristic portion of our national life; nor is the interest of the study by any means fined to archæological or historical details. On the contrary many questions relating our fisheries are of vital and permanent importance to large masses of the population; and welfare of the classes employed in these pursuits, the means for extending the consumption of fish amongst the poor, the discovery of new fishing-grounds, the acclimatization of species, the improvement of piscatorial implements and methods, and the establishment of Government vessels for the better instruction of fishermen, are but a few of the important topics relative to these matters to be found in the columns of Parliamentary Reports. when the reader has become familiar with the varied story and multiform relations of deeply interesting branch of the animal kingdom alike in its scientific and commercial aspects, he cannot do better than pay a visit to the lecture room of the Exhibition and learn how the whole of this widely reaching literature and organization is but the preliminary step towards the much needed development of this valuable food for the teeming and multiplying millions of our poorer population.

W. M. Adams,
*Formerly Fellow of New College, Oxford.*

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DIVISION LVII.—[*East Quadrant.*] *See Plan, p.* 102.

**ent fishing implements or their reproductions—models — s—books—emblems—charters and seals of ancient fishermen**

**DE CAUX, J. M.,** Great Yarmouth, "The Herring and Herring

**FABER, G. L.,** Her Britannic Majesty's Consulate, Fiume. Quaritch, 15 Piccadilly, London, 1883. "The Fisheries of the Adriatic and the oof, with a systematic list of the Adriatic Fauna." One vol. 4to.; engravings.

**GIBBS, MISS FLORENCE M.** Two China Hand-painted Salmon and Trout Flies.

**GUNN, T. E.,** 47 St. Giles' Street, Norwich. Original Drawings Fish.

**OLSEN, O. T.,** Fish-Dock Road, Grimsby. Ancient and Modern Fish and Fisheries.

**NEWTON & ESKELL,** High Holborn, "The Caterer," &c.

**PRICE, P. E. B.**

**SNOWDON, J. P.,** 59 Queen's Road, Saint John's Wood, London. Izaak Walton's House, Fleet Street, London. About Year 1624.

**WHITSTABLE COMPANY OF FREE FISHERIES AND ERS,** in the County of Kent, known as "*Whitstable Oyster Company,*" Thomas G. , Clerk, Whitstable. Act of Incorporation 1793, and the Seal of the Company.

**WHELDON, JOHN,** 58 Great Queen Street, W.C. Works on Fish ng.

DIVISION LX.—[*East Quadrant.*] *See Plan,* p. 102.

**orts, statistics, and literature of fish, fishing, and fisheries.**

**ARNOLD, JOHN WILLIAM,** 9 Park Street, Deal. Essay or n Drift Net Fisheries, Tides, Fish Haunts in certain weather, Fishery Harbours, &c.

**BARNETT, JAMES,** Kirkwall, Orkney. Map of the Orkney and Islands, and East Coast of Scotland, showing the necessity for increased telegraphic ation with fishing stations in Orkney and Shetland.

**BATES, W.,** Publisher, "Land and Water," 176 Fleet Street, E.C. s of "Land and Water." (2) Vols. of "Land and Water." (3) Frame of Prints, Fish, &c., Fishing and other subjects.

**CAPEL, CHARLES CECIL,** Cray Fishery, Foot's Cray, Kent. Pamphlets on Pisciculture for sale or presentation.

**EXETER, MARQUIS OF,** Burghley House, Stamford. (1) Books g. (2) Cornelius Gesnivus de Piscibus et Serpenter, Lib. 4, A.D. 1558. (3) Salvi-Piscibus. 1554 A.D. (4) L'Histoire Naturelle de la Lithologie et la Conchybiologie. (5) Monro structure of Fishes. 1785 A.D. (6) Marc Eliezer, block drawings by original copy rebound. 1797 A.D. (7) Aldrovandus de Piscibus et Coetis. A.D. ) Rodoletius de Piscibus. 1554 A.D. (9) Listan Historia Cochlearia. A.D. 1678.

**FISHERY BOARD FOR SCOTLAND,** Edinburgh. Twelve nual Reports to Parliament of the Fishery Board for Scotland, 1870 to 1881, inclu-d in one volume.

**FORSTER, D. & W. H.,** Ashbourn, Derbyshire. Book, "The Angler." 2nd edition, just published.

**GRESHAM ANGLING SOCIETY,** Mason's Hall Tavern, venue, Basinghall Street, E.C. Volume of Pamphlets, being essays on Angling ed subjects (read before the Society) at its meetings.


**ndia-Rubber Belting. India-Rubber Lined Fire Hose.**
**Leather " " " Delivery and Suction Hose.**
**Cotton " " " Steam Hose.**
**Patent Cerofilum " Woven Canvas Hose (Seamless).**
**India-Rubber Sheet, Valves, Buffers, Washers, Tubing, Packing, ats, Cords, Tyres, Squeegees, &c.**

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*ntractors to the Admiralty, the War Office, Metropolitan Board of Works, and London Metropolitan Police.*

**1012. HARDING, CHARLES W.,** Assoc. M. Inst. C.E., King's Norfolk. Report on the Smelt Fisheries.

**1013. HOLDSWORTH, E. W. H.,** 40 Pall Mall, London, S.W. ( 8vo. Volume, "Deep-Sea Fishing and Fishing Boats." An account of the practical of the various Fisheries around the British Islands, with Illustrations and descriptio Boats, Nets and other gear in use. (2) "British Industries—Sea Fishing."

**1015. INSPECTORS OF IRISH FISHERIES,** Dublin Dublin. A Map of Ireland, scale, 1 inch to the mile, showing by colours the rivers a salmon fishery districts, mouths of rivers and estuaries as defined within which certai of fishing are prohibited, sites of fixed engines and stone weirs, parts of rivers or coast by bye-laws, tidal and fresh-water boundaries, oyster beds, herring, mackerel and grounds, places within which trawling and trammel nets are prohibited, boundaries a quarters of Coast Guard divisions.

**1016. KNOWLES, JAMES,** Cambridge. Books on Fishing, in Dr. Day's Works on India and Ceylon; his British and Irish Fish; besides a series of on Angling and Trout Fishing.

**1017. LOVELL, MATILDA SOPHIA,** Catke Abbey, Derby. Edible Molluscs" of Great Britain and Ireland, with Recipes for Cooking them.

**1019. MACKENZIE, W.,** 69 Ludgate Hill, London, E.C. Bo "British Fresh-Water Fishes," by Houghton, with coloured and plain illustra Lydon.

**1020. OLSEN, T.,** Fish-Dock Road, Grimsby. (1) Piscatorial (2) Fisherman's Almanac, Seamanship, Signal System, Practical Navigator, Pa Atlas.

**1022. CHOLMONDELEY-PENNELL, H.,** 5 Cadogan Te S.W. "The Angler-Naturalist," "The Book of the Pike," "The Modern Practical "Fly-Fishing, Float-Fishing, and Trolling," "Fishing Gossip," "Pamphlets on Fish and Fisheries."

**1023. LOW, SAMPSON, MARSTON & CO.,** Publishers, 188 Street, London. (1) Bound Volumes of Fishing Gazette for 1879, 1880, 1881, 18 Specimens of the Weekly Number of the Fishing Gazette. (3) Notes on Fish and Fi by J. J. Manley, M.A. (Book.) (4) "Angling Literature." By O. Lambert. (Boo Float-fishing, and Spinning in the Thames Style. By T. M. Martin. (Book.) (6) Fishing in Rapid Streams." By R. Cutcliffe. (Book.)

**1024. SATCHELL, W.,** 19 Tavistock Street, Covent Garden, Lo W.C. The "Bibliotheca Piscatoria," by T. Westwood and T. Satchell on small and paper. "My Life as an Angler," by W. Henderson, Cheap edition. Also other "Flees and the Art a' Artyfichall Flee Making," by W. Aldam, containing the "Angler's Note Book." The Green Series. "The Secrets of Angling," by J. D. T. Westwood. 1613. "Citations touching on Fish and Fishing from Old English by T. Westwood and T. Satchell. "The Chronicle of the Compleat Angler," by T. and T. Satchell. "Dame Juliana Barnes's Treatyse of Fysshyng," by T. Satchell. form of the same, printed for the first time.

**1025. SMITH, JOHN,** Beighton House, Winchester Road, E "The Complete Angler, or Contemplative Man's Recreation," by Izaak Walton and Cotton, with original Memoirs and Notes by Sir Harris Nicolas. Pickering's edition of 1836, with 60 fine engravings and 60 India proofs, after designs by Inskipp; further illustrated with about 5000 drawings, etchings, engravings, autograph letters, &c., &c. Bound into 41 volumes, imperial quarto; nearly the plates, &c., inlaid, and all the letterpress. The collection commenced in 1841, and by John Smith.

**1026. TRENT CONSERVATORS' BOARD.** Map of district jurisdiction of the Trent Conservators.

**1027. TULLOCH, C.,** 12 Randolph Road, Maida Hill, W. Accounts Trawler. (2) Accounts of a Drift Boat. (3) Work on Sea Fishing.

**SEE** CLASS VI. DIVISION 60. No.1023 for

MESSRS. SAMPSON LOW, MARSTON, & Co.'s EXHIBIT OF

**THE FISHING GAZETTE.** Volumes for 1879 to 1882.

**THE FISHING GAZETTE.** Specimens of the Weekly Issue. 16 folio pages, price 1d.

**A FINE OLEOGRAPH OF TROUT.** Entitled "An Evening's Fishing," and Targett (Copyright of the Editor of the *Fishing Gazette*). These permanent copies in Sixteen colours can be had of the Publishers. Price 5s. each, unframed.

Also, SEVERAL BOOKS ON ANGLING.

London: SAMPSON LOW, MARSTON, SEARLE, & RIVINGTON, Ltd., Fleet Street, E.C.

. **WILKINS, FREDERIC, C. E.**, 55 Poland Street, London, W. s and Drowning," price 1s., a pamphlet classifying the causes from which 8,000 lives ually lost at sea, and £8,000,000 worth of property, with suggestions for preventing these With other important information.

a. **BERNEY, GEORGE DUCKETT**, Morton Hall, Norwich. n manuscript. "Short account of an Expedition to the Continent, undertaken in 1852, purpose of introducing into England several species of Fresh-water Fishes at that time n to it—viz.: Golden Tench, Pond Loach, Scaleless Carp, Royal Carp, Sly "

. **FRYER, C. E.**, Home Office, S.W. Reports, Tables, and Map, to fisheries: prepared by, or in connection with, the Fisheries Department of the ffice.

DIVISION LXI.—[*East Quadrant.*] *See Plan, p.* 102.

## ports on Acclimatization of Fish and of attempts in the direction.

. **CHAMBERS, W. OLDHAM**, F.L.S., Hon. Secretary to the and Suffolk Fish Acclimatization Society, Lowestoft. Report of the Norfolk and Fish Acclimatization Society—Patron H.R.H. the Prince of Wales; President. E. k, Esq., M.P.—showing the attempts that have been made to acclimatize food fishes in ns of East Anglia.

a. **NATIONAL FISH CULTURE ASSOCIATION**, President, quis of Exeter, Chairman. Sir J. G. Maitland, Bart. Secretary, W. Oldham Chambers, Reports of the Deutscher Fisherei Verein, and of other Fish Cultural Associations. f the Berlin Exhibition, &c.

b. **YOUL, I. A.**, C.M.G., Waratah House, King's Road, Clapham Park. of the Introduction of the Salmonidæ to the Antipodes, by Arthur Nieves. History of oduction of the Salmonidæ to the Antipodes, by Dr. Levi and Sickeiron.

## OBJECTS EXHIBITED IN THE GROUNDS.

. **EXETER, THE MOST HONOURABLE THE MARQUIS** rghley Park, Stamford. Skeleton of a Whale, 60 feet in length.

. **PRIMROSE & COMPANY**, Sheffield. Conservatory Aquarium l on Patent System).

. INDESTRUCTIBLE PAINT BUILDING, United Asbestos Company, 161 Queen Street, E.C.

. POST AND TELEGRAPH OFFICE.

. **CLARK, BUNNETT & CO., Limited**, Engineers, Rathbone Oxford Street, London. (1) Model of Smith's Hydraulic Dredging Plant. (2) Work- del of Hydraulic Fish Hoist. (3) Fire-proof Iron Landing Sheds. (Clark's Patent ipping Crabs.)

. WILLESDEN PAPER COMPANY'S FISHERMAN'S COTTAGE.

. **HUMPHREYS, J. C.**, Albert Gate, High Road, Knightsbridge. ion's Cottage, living Room and two Bedrooms, furnished ready for use, including all ries, the whole to be erected complete in any part of the United Kingdom for the sum of It is to show an economical way, and how cheaply fishermen can be comfortably housed, ter how wild or stormy the coast. The cottage will also be useful for coast guard , life-saving stations, &c. It can be erected complete in any part of the United m in one month, or packed and sent abroad for re-erection.

. **ANGLO-NORWEGIAN GUANO, PHOSPHATE & ISIN- S CO., Limited.** Dashwood House, New Broad Street, E.C. (1) Samples of ss. (2) Samples of Cod Liver Oil.

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**1041.** Engine House.

**1042.** Extended Trawl Net.

**1043.** London Stereoscopic Company. Subjects issued: (1) Her Maj the Queen. (2) The Prince of Wales, "Tell the Fishes He's the Queen's Son." (3 Opening Ceremony. (4) General View of the Various Divisions, its Courts and Tr (5) Groups of Scotch Fisherwomen. (6) Groups of Belgian Fisherwomen. (7) Gr Dutch Fisherwomen. (8) Groups of Naval Volunteers. (9) Groups of Austro-Hu Sailors. (10) The Baroness Coutts' Fish Dining Saloon. (11) The Net Makers at W (12) The Fish Kitchen. (13) A "Monster of the Deep" (with arms 30 feet long). The Prince of Wales' Pavilion, Exterior and Interior. (15) The Eira Boat and the "Bob." (16) The Grace Darling Boat and Oar. (17) Group of Scotch Fishermen. Group of Irish Fishermen. (19) The Diver in Garden. (20) The Great Walrus. (21) G of Sea Lions. (22) The Chinese Pagoda. (23) The Picture Vestibule. (24) The Ve

**1044. SIEBE, GORMAN & CO.,** Diving Apparatus in Large d Also collection of Relics of the Deep in a special building.

**1045.** Shipwrecked Fishermen and Mariners' Home. Under the au of the Shipwrecked Fishermen and Mariners' Royal Benevolent Society. A Day Ho place of enquiry and resort for Fishermen, &c., of all countries visiting the Exhibition.

**1046. MANUFACTURERS' AND MILLOWNERS' ASSOCIA**tion. Incorporated by special Act of Parliament (44 & 45 Vict. cap. 203) for the purpo assisting manufacturers, millowners, and others to comply with the provisions of the Pollution Prevention Act. Collective Exhibit of Models for purifying the discharge from and copper mines, paper mills, tanneries, china clay, and other works, and specimens of discharge as it flows from those works, and as, after treatment, it enters the stream, specimens also of the clays and other substances extracted in the course of the treatment.

**1047. KNOWLES, W.,** 53 Moscow Road, Bayswater. Model of a Fri

**1047*a*. ZOOLOGICAL SOCIETY,** Hanover Square, London. (1) Greater Black-backed Gull (*Larus marinus*). (2) Lesser Black-backed Gull (*La fuscus*). (3) Herring Gull (*Larus argentatus*). (4) Common Gull (*Larus canus*). (5) Bl headed Gull (*Larus ridibundus*). (6) Gannet (*Sula bassana*). (7) White Pelican (*Pel onocrotolus*). (8) Flamingo (*Phœnicopterus antiquorum*). (9) Bar-tailed Godwit (*Lim lapponica*). (10) Cormorant (*Phalacrocorax carbo*), by Capt. Salvin. (11) One or Two Ma Tortoises or Terrapins. (12) Crab-eating Racoon (*Procyon cancrivorus*). (13) Coypu (*Myopotamus coypus.*) (14) Common Seal (*Phoca vitulina*), by the Committee. (15) B (*Castor canadensis*), by the Marquis of Bute.

**1048. SEVERN FISHERY BOARD.** J. W. Willis Bund, Chairm Nets (*Moveable.*) (1) Cleeching Net. This net is used chiefly in floods to take fish that found their way into any ditch or backwater. It is one of the most poaching nets used. Eel Net. These nets are fixed across the river in the summer and autumn to catch migrating seawards. They fish the middle of the river, the bottom line on the bed the stream, the top a few feet below the surface, so as to let the rubbish pass They are only used when the water is high and discoloured. (3) Beating Net. Net by fishermen in the freshwater. It is fastened round a bush or tree, and the water the net beaten with poles, the fish trying to escape get caught in the net. It is a or armoured Net. (4) Lave Net. Net used by fishermen used in the estuary to take on the sands in the shallow water. (5) Shrimp Net. Net used on the sands for shrimps and small fish. *Nets (Fixed).* (6) Stop Net. Net used in the tidal portion of river. Fish ascending or descending the river strike against it. The string is and the fish caught in a bag. (7) Sprat Nets. Nets fixed to stakes in the tidal part of the river in the autumn and winter months to take sprats coming down on the ebb *Fixed Engine.* (8) Putchers. Engines used in the Bristol Channel for catching Sal They are fixed in certain places in ranks, and the tide forces the fish into them. (9) Putts No. 1. These Putts are used at the Count Rocks, Oldbury, Gloucestershire, for taking shrimps, and various kinds of fish. The smaller fish get carried by the tide into the part of the Putts. The large fish are prevented passing the Putts, and generally

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**The above material is fixed in the First and Second Class Refreshment Rooms.**

ls near them, (10) Putts No. 2. These putts are used on the mud near the New Passage ucestershire, for taking shrimps, small soles and sea fish. Occasionally salmon are taken them, but only under exceptional circumstances. (11) Weels used on the apron of Weirs taking Lamperns. Lamperns ascend the river in large numbers in the autumn and winter ing a fresh, and then baskets are placed on the Weirs with their mouth down stream, and lamperns find their way into them. (12) Eel Putchons. These are the ordinary eel kets that are baited and placed in the river during the spring and summer months for eels. Hard Weels. Large baskets in which eels and lamperns are kept alive until sold. (14) ncles. Boats used on the Upper Severn and Welch Rivers by the fishermen. (15) Model unk or Well Coat. The usual mode of keeping fish alive is by placing them in one of the *Fish Passes.* (16) Plan and section of Fish ,Pass at Glenhafron on the Severn; ple of a Pool Pass. (17) Plan and section of Fish Pass at Milford near Newtown, gomeryshire. (18) Plan and section of Fish Pass at Penarth Weir on the Severn. Plan of Fish Pass at Powick Weir, Worcestershire. (20) Plan of Grating at Abertanat, gomeryshire, to prevent fish descending Canal. (21) Model of same. (22) Plan of ng at Brinfield, Shropshire. (23). Old Plan of the Fixed Engine in the Severn Estuary 1865. (24) Photograph of an ancient mode of fishing declared illegal in 1861, carried Dolanog, Montgomeryshire, on the Verniew.

49. **THOMAS, E. C. G.,** National Club, Whitehall. (1) Model of ur for fishery purposes, consisting of a floating breakwater or outer harbour, as an age at all times of tide and weather; an inner harbour with wharves, the sea walls so as to form a well-defined entrance, and constructed in such a form as to admit additional water, and thus make the outgoing tide completely overcome the incoming one in its on the bar at the mouth of any river or creek. This action, aided by the automatic rine dredge, permanently sweeps away the bar and prevents it from reforming. (2) of Greenway Breakwater sheltering a lighthouse, and giving access to them at all times. preventing the chance of the starvation of the men and extinction of the lights as almost ed recently at three of the most important lighthouses—Calf, Wolf, and Eddystone. odel of Greenway Breakwater as supplementing existing harbour works, protecting the g stone piers, and thus obviating the necessity for frequent repairs as at Wick (where overturned a massive coping of 800 tons in one block), Plymouth, &c., creating an onal outer-anchorage. (4) Electric Motor Wave Apparatus and Tank, for showing the of waves in motion on the Greenway Breakwater, with Model of Fishery Harbour and house protected by the breakwater.

50. A Riverside Danish Military and Fishing Tent (next to Flamingo

51. **ALLEN, EDWARD ELLIS,** 111 Cheyne Walk, Chelsea. Fisher-Cottage constructed on new principle of corrugated iron or zinc, with wood lining.

52. **PARRETT,** Forest Hill and Brockley. Rustic Arbours, &c.

53. **MOLONEY, ALFRED,** Church Road, Richmond, Surrey. (1) Fishing Pot from Lagos, West Africa. (2) Scoop for bailing out Canoe. (3) Fishing of native manufacture, with specimen of fibre of which made, and stone substitute for g lead, Lagos, Gold Coast Colony, West Africa.

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CLASS I.

DIVISION I.

## CORNWALL COUNTY COMMITTEE.

a. **JAMES, C. J.,** Newlyn. Herring Net (hand-made).

b. **MURRISH, J.,** Newlyn. Pilchard Net (hand-made).

c. **KITCHEN, H. F.,** Newlyn. Trammel (hand-made), invented by itor.

**ANDERSON, ABBOTT, AND ANDERSON'S**
**37, Queen Victoria Street,**
**London, E.C.**
**WATER AND AIR BEDS**
are
invaluable to
Patients in preventing Bed
*Sores,* and giving great ease and comfort.

32*d*. **HUMPHREYS, WILLIAM,** Newlyn. Foot Rope Nets (hand-ma

32*e*. **RICHARDS, HY.,** Mousehole. Fly Net (hand-made).

32*f*. **COX, JOHN,** Cadgwith. (1) Seine for rough ground. (2) for catching fish at a great distance from land.

32*g*. **CLIMO, JOSEPH E.,** Fowey. (1) Trammel. (2) Red M Net. (3) Salmon Net. (4) Shrimp Net. (5) Hoop Net. (6) Three specimens of Nets. (7) Bolter. (8) Card containing thirteen sizes of hooks.

32*h*. **KITTO & SONS, MESSRS.,** Porthleven. (1) Mackerel machine-made. (2) Herring Net, ditto.

32*i*. **GEORGE, J. B.,** St. Mawes. Seine for catching fish at a distance from land.

32*j*. **NAUTILUS CLUB,** Penzance. (1) Case of hand-line fishing (2) Spillar.

32*k*. **RASHLEIGH, E. W.,** Kilmarth, Par. Two Cases of Old-fash Fishing Gear.

32*l*. **DAVIES, JAMES,** Newlyn. (1) Keg Buoy, for floating drift (2) Can Buoy, for ditto.

32*m*. **BADCOCK, THOMAS,** Newlyn. Deep-Sea Fishing Line.

32*n*. **HILLS & HONEY,** Port Isaac. (1) Ground Line for Cod, &c. (2) Ground Line for Whiting, Gurnard, &c.

32*o*. **HAZELAND, S. S.,** Fowey. (1) Patent Treble Swivelled Row (2) Patent Self-feathering Oar.

32*p*. **OLVER, D.,** Looe. Old-fashioned Binnacle.

32*q*. **LAUGHRIN, WILLIAM,** Polperro. (1) Tangles. (2) Dredge

32*r*. **NICHOLAS, J.,** Land's End. Cowel for carrying fish.

32*s*. **WALLIS, W.,** Newlyn. (1) Cowel for carrying fish. (2) basket for taking fish out of seine.

32*t*. **PAYNTER, J.,** Bocastle. (1) New Method for catching Crab (2) Model of Boat davits. Own invention.

## Division II.

## CORNWALL COUNTY COMMITTEE.

32*u*. **CHARD, JOHN,** Falmouth. (1) Crayfish Pot. (2) Eel Pot. Wrasse Pot.

32*v*. **GEORGE, M.,** Land's End. Models of Lobster Pots.

32*w*. **CLIMO, J. E.,** Fowey. Lobster and Crab Pot.

32*x*. **KERKIN, J.,** Mevagissey. (1) Lobster Pot. (2) Store Pot. Crab Pot. (4) Wrasse Pot.

32*y*. **COLLINS, LEONARD,** Port Isaac. Two Crab Pots.

32*z*. **THOMAS, JAMES,** Porthleven. Crab Pot.

## Division III.

32*aa*. **BLEWETT, JOHN,** Newlyn. Model of Lug Sail Boat, adapted drift fishery.

32*ab*. **ROBERTS, HENRY,** Mevagissey. Model of Lug Sail Boat, ada for drift fishery.

32*ac*. **GEARD, MRS.,** Newlyn. Model of Mount's Bay Fishing Lug with nets.

The Best and Cheapest. First Established 1825.

**NEAVE'S FOOD** FOR **INFANTS AND INVALIDS.**

IN ONE-POUND ONE SHILLING CANISTERS.

SOLD EVERYWHERE. WHOLESALE OF THE MANUFACTURERS

**J. R. NEAVE & Co., Fordingbridge, England.**

d. **MANN, WILLIAM,** Newlyn. Model of Mount's Bay Fishing e, with nets. (Cut out with knife shown in case.)

e. **WILLIAMS, WILLIAM,** Mousehole. Model of Land's End Seine ith follyer.

f. **PEZZACK, WILLIAM,** Newlyn. Model of Mount's Bay Seine Boat, k boat.

g. **HALY, E.,** Falmouth. Model of Falmouth Trawler.

h. **RASHLEIGH, E. W.,** Kilmarth. Case of Models of Ancient and Fishing Boats.

i. **MITCHELL, ROBERT,** Port Isaac. (1) Two Half Models of Boats suited for beaching. (2) Pilchard Driver. (3) Crabber and Cod or Ling Boat.

j. **RICHARDS, B.,** Penzance. Siamese Twin Canoe.

k. **ORCHARD, WILLIAM,** St. Austell. Photographs of Mevagissey.

l. **GIBSON, J.,** Photographer, Penzance. Photographs of boats, &c.

## Division V.

a. **STEPHENS, J., SON,** Ashfield, Falmouth. (1) Sample Baltic and Hemp, various makes and sizes; Steel and Iron Rope, galvanised and ungalvanised, sections (in case). (2) Tarred Manilla Trawl Warp, suitable for North Sea Fishing. ple of Flexible Steel Wire Rope for Bolt Rope, galvanised. (4) Sample of ditto nised.

## Division VI.

o. **VIVIAN, MACKENZIE,** Tuckingmill, Camborne. Hand Capstan ding Boats.

p. **DUNN, MOSES,** Mevagissey. Anchor.

q. **CLIMO, J. E.,** Fowey. Improved Pickaxe Anchor.

r. **HEWITT, SIR HAROLD,** Bart., Salcombe, Devon. Patent Collapnchor.

s. **CHARD, JOHN,** Falmouth. Patent Grapnel (teeth unscrew).

t. **HAYNE, JAMES,** Port Isaac. Model of Floating Anchor with Oil r smoothing water) and drag attached.

## Division XXI.

u. **HICKS, WILLIAM,** Looe. Hand-knitted Frocks and Hose.

v. **PEEL, MRS.,** Trenant Park, Duloe. Hand-knitted Guernsey Frocks.

w. **COTTON, MISS,** Newlyn. Hand-knitted Guernsey Frock.

x. **GUY, JAMES,** Newlyn. Fishermen's Sea Boots.

y. **BOSTOCK, F.,** London. Porpoise-hide Boots.

## Division XXIII.

z. **OLVER, D.,** Looe. Model of Fisherman's Cottage.

a. **THOMAS, J.,** Land's End. Model of Longships Lighthouse.

## Division XXV.

b. **ROWE, JAMES,** Mousehole. Model of Pilchard Curing House.

**INCUBATORS** FOR HATCHING OUT **CHICKENS** DURING **ALL THE YEAR.**

**Patronised by H.R.H. THE PRINCE OF WALES.**

The Eggs placed in one of these Incubators are turned night and morning and maintained in a regular temperature of 104°. Fresh air and moisture are provided, and the Chickens hatch out strong and healthy by the 21st day. Prices range from **30s.** upwards. The larger patterns are made self-heating and self-regulating, and do not require more than 5 minutes' attention night and morning.

Guide Books to the System, **1s.** each; by post, **1s. 2d.**

THOS. CHRISTY & CO., 155, FENCHURCH ST., LONDON.

DIVISION XXVI.

32*bc*. **PERRY, W. T. L.**, Penzance. Case containing: (1) Marinated P chards. (2) Pickled Pilchards. (3) Smoked Pilchards. (4) Kippered Hake.

32*bd*. **SULLIVAN, ANTHONY**, Newlyn. Quarter Hogsheads of P maids.

32*be*. **CORNISH SARDINE COMPANY**, Mevagissey. (1) Two-d boxes of Cornish Sardines. (2) Two-dozen boxes of Pilchards in oil.

DIVISION XXIX.

32*bf*. **SULLIVAN, A.**, Newlyn. (1) One quart bottle of Pilchard refined. (2) One quart bottle of Pilchard Oil in crude state.

32*bg*. **LAUGHRIN, WILLIAM**, Polperro. Half-pint bottle of Oil ples, showing how much Oil can be produced from certain weights of liver in the fo fish :—Torpedo Ray, Common Ray, Ling, Conger Eel, Dog Fish, Cod.

DIVISION XLVI.

32*bh*. **LAUGHRIN, WILLIAM.** Polperro. (1) Barnacles in Spirit Lepas Fascicularis. (3) Lepas Autifere. (4) Teredo Worm. (5) Wood bored by the T Worm. (6) Wood Piddock (Hylophaga Dorsalis). (7) Two cases of Crustacea, cont 100 kinds, all English, found on the coast of Cornwall. (8) Sturgeon 7 ft. long, weight (9) A Paper on the Growth of Barnacles on Ships' Bottoms and Floating Logs.

*Acting Agent for Cornish Committee,*
J. BENNETT, ESQ.,
150, Vauxhall Bridge Road,
London, S.W.


# THOMPSON'S

## SMOKELESS KILN AND OVEN CO., Limd.

76, COLEMAN STREET, E.C.

*One of this Company's Patent Gas Ovens is used daily in this Exhibition by*

MESSRS. BERTRAM AND ROBERTS,

*REFRESHMENT CONTRACTORS,*

*in whose Kitchen it may be seen in operation.*

APPLY AS ABOVE.

# ISLE OF MAN:

(*See Plan, p. 76.*)

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le of Man is an island in the British Seas, 35 miles long and about 12 miles at atest breadth, containing an area of about 350 square miles, and a population of souls. The island enjoys the advantages of Home Rule. It has its own legislature, judicature, and an independent revenue. There are five ports in the island from fishery operations are mainly conducted, viz., Douglas, Ramsey, Peel, Port St. Mary, rt Erin. Peel is the most important of these ports. The town of Peel possesses 194 s boats, measuring 5,044 tons; 170 of these boats are supplied with full trains of l and herring nets, and represent a total capital of £750 a boat, or £127,500. The 24 oats are supplied with only a herring train, and represent a capital of £550 each, or 0. Peel has about 35 second-class boats, representing £200 each, or £7,000. The apital embarked in the fishery at Peel is therefore £147,700. 1,727 men and boys ployed in the fishery. Port St. Mary, with the adjacent ports of Castletown and Port s the next most important. It contains 101 boats, representing a tonnage of 2,095 tons, capital of £80,800, and employing 787 men and boys. In addition, 10 boats manned men each, are employed in the southern ports of the island lobster fishing, and earn These boats are principally engaged in the spring and early summer in the Kinsale rel fishery; in the summer and autumn, in the home and Irish herring fishery; and winter, to a certain extent, in the long-line fishery; but they also go to Scotland and s parts of England. The earnings of the Peel boats are said to amount to—Kinsale rel fishery, £42,000; Herring fishery, 40,000; Long-line fishery, 1,500—total £83,500. g the earnings of the Port St. Mary boats at the same proportion, they would amount ,500. The port of Douglas contains 11 first-class boats, 15 second-class boats, and 9 class boats, having a total tonnage of 333 tons, employing 119 men and boys, and l at £2,800. The larger of these boats are trawlers, and work between Liverpool and land. Ramsey has 90 boats engaged in the fishery, with a tonnage of 609 tons, enting a value of £10,306 and employing 219 men and boys. The principal fishery s the long-line fishery for cod, which extends from the beginning of October to the May. In October, November, April, and May, it is conducted in small open lug-rigged manned by 5 men; during December, January, February, and March, the fishery is ted in deep sea-fishing boats yawl-rigged, with 50 feet keel and of 50 tons burthen. od fishery thus occupies the time of the Ramsey fishermen for eight months out of twelve. During the summer months four of the cod boats are engaged in fishing for on the west of the island, four of them go to Kinsale, while 64 boats, each manned by e man, are engaged in fishing for mackerel. The statistics of the Ramsey fishery may mmarized as follows:—Number of boats, 90; tons, 609; men and boys, 219; value, . The yield of the Ramsey fishery is as follows:—1. Open cod boats, £1,560; 2. sea boats, £5,760; 3. Mackerel fishery, £1,344; 4. Eels, &c., fishery, £720; 5. Kinsale y, £1,200; 6. Miscellaneous, lobsters, &c., £300—total, £10,884. The capital, therefore, ted in the fisheries of the Isle of Man is as follows:—1. Peel, £147,700; 2. Port St. Castletown, &c, £80,500; 3. Ramsey, £10,306; 4. Douglas, £2,800—total, £241,306. eople employed in fishing in the Isle of Man are as follows:—1. Peel, 1,727; 2. Port St. Castletown, &c., 787; 3. Ramsey, 219; 4. Douglas, 119; 5. Lobster fishing, 20—total, The yield of the Insular fisheries may be computed as follows:—1. Peel, £83,500; St. Mary, Castletown, &c., £40,500; 3. Ramsey, £10,884; 4. Douglas, £5,000; 5. ter fishing, *£500—total, £140,884.* In round numbers, therefore, some £250,000 in

K

embarked in the fishery, while the returns are about £140,000 annually. Assuming 10 per cent. is required annually to replace the capital, and repay the interest on it, £1[illegible] is available for division among the 2,870 men and boys employed, or £1 a week for each and boy for 40 weeks during each year. These figures do not, however, represent the value of the fisheries to the island. It will be readily understood that the fisheries indirectly support a considerable number of persons who are engaged as boat builders, net makers, other ways for supplying the fisheries; the boats which are built in the Isle of Man herring fishery are probably the finest and best found in the world; 700 people, at the lowest estimate, are employed in these industries. While out of a total population of more than 53,000, 2,870 men and boys, representing 11,000 people, are engaged in 700 other people, men, women, girls, and boys, representing say a population of 2,000 employed in industries dependent on fishing; 13,000 people out of a population of 53,000 thus either directly or indirectly dependent on fishing for their livelihood. The Insular Government have of late years spent large sums of money in improving the harbours the island. It is at the present moment improving the harbour at Peel, with the object of improving the fishing industry, at a cost of £24,300; and it is constructing a breakwater at Port St. Mary, at a cost of £15,580. Plans of these harbours are at Exhibition. The Insular Government is also spending considerable sums of money in works at Ramsey, Port Erin, and Douglas. There is no other portion of Europe, and the exception of Newfoundland, there is probably no other country in the world where large a proportion of the population is dependent on fishing for their livelihood. Britain is usually supposed to have the most important fisheries in the world. In Britain probably 100,000 men (say 400,000 people with their families) earn their by fishing; and one person out of about every 75 is thus dependent on the fisheries. Isle of Man one person out of every five depends on fishing for his daily bread, and person out of every four is directly or indirectly dependent on fishing for a livelihood.

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## LIST OF EXHIBITS FROM THE ISLE OF MAN.

### CLASS I.—SECTION I.

### FISHING.

[SEA FISHING.]

### DIVISION I.

**Gear of every description, and of all nations used in trawl, long line, hand line, and every other mode or system of including all nets, lines, hooks, harpoons, tackle, &c., employed the same.**

**CORRIN BROTHERS**, Net Manufacturers, Peel. (1) Two and mounted Herring Nets. (2) Two Barked and mounted Mackerel Nets. (3) unmounted Herring Net. (4) Two White unmounted Mackerel Nets. (5) Two unmounted Mackerel Nets. (6) Two White unmounted Mackerel Nets. (7) of Thread.

EDWARD SMITH'S NEW CHORAL SINGING TOP is, without doubt, the most wonderful top ever invented. It plays most beautiful chords and harmonies, which can be instantly changed without stopping or in any way impeding the motion of the top. Children are amused with it for hours. It is of most simple construction. Price, in box, 2s. 4d., post free. Grand Illustrated Catalogue of Toys and Games sent post free to any part of the world, 4 stamps.
EDWARD SMITH, The City Toy Shop, 3, Cheapside, E.C.

NO MORE SCISSORS TO GRIND, OH!
EDWARD SMITH'S
NEW SCISSOR SHARPENER, Regd.
Is the wonder of the age. It will put a better edge on a pair of scissors in ten seconds than any grinder could in minutes, and it will never wear out; the [illegible] most simple; it does not wear away the scissors in the least; no household should be without one. [illegible] sharpener will be found not only useful but a [illegible] book. In neat box, with full directions. Post free, [illegible]
EDWARD SMITH, The City Toy Shop, 3, Cheapside, E.C.

**GOLDSMITH, HENRY,** Ramsey. (1) One "Mudlag" or Buckie r bait catching. (2) One Sand Eel or Gibbon Grip. (3) One Pair of "Corran Gib-Sand Eel Sickles.

**JOUGHIN, JOHN,** Net Manufacturer, Peel. (1) One Cotton el Net, mounted and ready for use. (2) One Cotton Mackerel Net, plain in web. (3) ton Herring Net, mounted and ready for use. (4) One Cotton Herring Net, plain ee Cotton Herring Nets, plain. (6) One Pilchard Net.

**KNOX, WILLIAM,** Douglas. Net Sinkers, of a composition that rust or corrode the net or ropes.

**LOONEY, EDWARD,** Ramsey. (1) One Balk or long line for cod-barked, with "mollag," or buoy, and hair "thow," or buoy rope. (2) One Fluke or line. (3) One Whiting Line. (4) One Mackerel Line. (5) One Scallop Dredge.

**MOORE, THOMAS, C. S.,** Net Manufacturer, Peel. (1) One Piece erel Net, full mounted. (2) One ditto, plain white, as taken off loom. (3) One Piece ing Net, full mounted. (4) One ditto, plain white, as taken off loom, 50-9 ply yarn. ditto, plain white, as taken off loom, 18-4 ply yarn.

**QUALTROUGH, EDWARD,** Net Manufacturer, Port St. Mary. e Cotton Mackerel Net, complete, showing method of mounting, roping, tanning, &c. Cotton Mackerel Net, showing manufacture and quality. (3) One Cotton Herring mplete, showing method of mounting, roping, tanning, &c. (4) One Cotton Herring owing manufacture and quality. (5) Ivory Netting Needle used for mending nets.

**QUANE, C. B.,** Douglas. Two Horsehair Lines for hand fishing, to those formerly used by the Manx fishermen.

## Division III.

**ng craft of all nations; models and representations of the same.**

i. Steam fishing vessels and steam carriers—

**ISLE OF MAN STEAM PACKET COMPANY.** Models of their s:—(1) "Mona's Isle," 330 × 38 × 15. Gross tonnage, 1,500. Indicated horse-power, (2) "Ben-my-Chree," 310 × 31 × 13·6. Gross tonnage, 1030. Indicated horse-power, (3) "King Orry," 260 × 29 × 14·6. Gross tonnage, 813. Indicated horse-power, 1800. naefell," 250 × 29 × 14·6. Gross tonnage, 785. Indicated horse-power, 1800. (5) la," 200 × 26 × 15·6. Gross tonnage 518. Indicated horse-power, 1000.

## Division IV.

ii. Fishing Vessels and Boats other than Steam Vessels—

**BRAYDON, THOMAS,** Ramsey. Model of 24 feet open Cod Boat, inch to foot, with sails and equipment complete, mounted on bog-oak stand.

**GRAVES, HENRY,** Boat Builder, &c., Peel. Model of an elliptical "Dandy" rig Fishing-boat, 50 feet keel and 16 feet beam; scale ½ inch to the foot. is rapidly superseding the class of boat for many years used in the Isle of Man, as "Nickeys," or lug sail boats, none of which are being built at present. The er supplies a large number similar to the model, but varying in size from 44 to 50 feet the South and West Coasts of Ireland, and in their construction and the home trade at times from 80 to 100 men, including carpenters, joiners, sail makers, rope makers makers, shipsmiths, &c.

Specially suitable for Sportsmen, as it combines perfect ventilation, with absolute protection both to the wearer and the Gun.

THE "BUCKLAND" COAT. (REGISTERED.)

MAKERS,
37, QUEEN VICTORIA ST., LONDON, E.C.
ANDERSON, ABBOTT, AND ANDERSON.

**HARRISON, RICHARD,** Port St. Mary. Model of Manx Fishi boat, with lifting decks to show inside fittings, built on scale, framed and planked.

**LUCAS, KELLOR,** Ramsey. Model of Bahama Lightship, Ram Bay.

**QUALTROUGH & CO.,** Ship Builders, Douglas. Half-mod Fishing Boat, of 50 feet keel, 15 feet 6 inch beam, and 8 feet 6 inch depth. Dandy rig. with sails, anchors and chains complete, £500.

**QUALTROUGH, JOSEPH,** Ship Builder, Port St. Mary. of Fishing Boat, 48 feet keel, 14 feet 6 inch beam, depth of hold 8 feet, framework oak, plank pitch pine, iron capstan, lugger rigged, cost £370 complete; scale ½ inch to the foot.

**WATSON, T.,** Ship Builder, Peel. (1) Model of Lug Rigged Fi Boat. (2) Model of Dandy Rigged Fishing Boat.

## Division V.

### Ropes and canvas suitable to fishing vessels.

**GRAVES, HENRY,** Rope Manufacturer, &c., Peel. Sampl Ropes used for mackerel fishing, the largest being the hauling rope, the medium, the that used at foot, and the smallest at top of net; also sample of coil of Manilla rope rigging Dandy-rigged fishing boat.

**MOORE & SON, W. F.,** Sail Cloth Manufacturers, Tr Douglas. Seven Bolts, first quality, from No. 1 to 7, all long flax sail-cloth, and spec the flax from which the sailcloth is made, showing the various processes through which from its growth to the manufactured state.

**QUIGGIN & Co.,** Rope Manufacturers, Douglas. (1) Sam Rope, 60 fms., 5 inch tarred Manilla trawl rope, 4 strand. (2) One Coil Manilla Top Rop as supplied for Kinsale Fishery. (3) One Coil Manilla Sole Ropes, ditto. (4) One Coil Stoppers, ditto. (5) Four Coil Manilla Spring Backs, ditto. 2¾ in., 2½ in., 2¼ in., Fifty fathoms 4-in. Manilla Swing, 4 strand. (7) One Coil 4-in. Bolt Rope, for fishing sails. (8) One Coil tarred Manilla Trawl warp, 60 fms. 5½ in., 4 strand.

## Division VI.

### Steam and hand capstans, compasses, barometers, tele lights, lamps, fog horns, systems of signalling at night for fi fleets and vessels, electric lights, luminous paint, and other ment of fishing vessels, charts for fishermen.

**HENDRICK, EDWARD,** Douglas. Steam Capstan Engi Fishing boats.

**KNOX, WILLIAM,** Douglas. Steam Capstan for Fishing complete, fitted in boat.

## Class II.

## ECONOMIC CONDITION OF FISHERMEN.

## Division XXI.

### Apparel and personal equipment.

**KNEALE, WILLIAM HARDY,** Ramsey. (1) One Pair "L tan" Woollen Trousers, undyed, hand-spun and woven. (2) One Pair "Russett" Trousers, undyed, hand-spun, and woven. (3) One Coat and Vest of Manx make, cloth. (4) One "Plucked wool" hand spun and woven Jersey. (5) One "Clipped wool" spun and woven Jersey. (6) One "Curleid Lhiabbe," or sleeping-rug, used at sea by Manx men. Double twisted yarns. Double warp and weft, hand spun and woven. (7) Ensign.

**India-Rubber Belting.** **India-Rubber Lined Fire Hose.**
**Leather** ,, ,, ,, **Delivery and Suction Hose.**
**Cotton** ,, ,, ,, **Steam Hose.**
**Patent Cerofilum** ,, **Woven Canvas Hose (Seamless).**
**India-Rubber Sheet, Valves, Buffers, Washers, Tubing, Packing, Mats, Cords, Tyres, Squeegees, &c.**

ANDERSON, ABBOTT, & ANDERSON,
**INDIA-RUBBER MANUFACTURERS.**
*Contractors to the Admiralty, the War Office, Metropolitan Board of Works, and Metropolitan Police.*

## CLASS V.
## NATURAL HISTORY.
[AQUARIA.]

### DIVISION XLVI.

**mens living (marine and fresh water), fresh, stuffed or pre-casts, drawings, and representations of—**

ollusca of all kinds and shells not included in Class III.

**OLDSMITH, H.**, Ramsey. (1) Specimens of Mudlag, or Buckies, . (2) Specimens of Scallops. (3) Specimens of Sea Urchins.

### DIVISION XLVIII.

orms used for bait, or noxious; leeches, &c.

**ERMODE, P. M. C.**, Ramsey. (1) Specimens of Lug Worm. (2) of White Worm.

### DIVISION LI.

ish of all kinds.

**OLDSMITH, H.**, Ramsey. Fork beard Fish.

### DIVISION LIII.

quatic and other birds hostile to fish or fishing.

**INVIG, T. H.**, Castletown. Stuffed Specimens of—(1) Great Diver. (2) Large Cormorant. (3) Tufted Cormorant or "Shag." (4) Guillemot . (6) Channel or Razor Bill. (7) Black back Gull. (8) Sea or Herring Gull. n Eye Garrotts. (10) Pochards. (11) Wild Goose. (12) Mallard. (13) Wild .4) Maganza Duck. (15) Widgeon. (16) Heron. (17) Sheldrake. (18) Gannets, gomaster Gull. (20) Curlew. (21) Pacific Curlew. (22) Kittywake (Gull.) (23) 1) Oyster Catcher.

## CLASS VI.
## RY AND LITERATURE OF FISHING—FISHERY LAWS—FISH COMMERCE.

### DIVISION LVII.

**ent fishing implements or their reproductions — models — s—books—emblems—charters and seals of ancient fishermen**

**CRAINE, JOHN**, Publisher, Ramsey. Messrs. Poulton's Photo-Views of Manx Marine Scenery.

**DEAN, G. A.**, Photographer, Douglas. Coast and Lighthouse Views Man.

**INSULAR GOVERNMENT.** Plans of Insular Harbours.


# TIDMAN'S SEA SALT,

**FOR PRODUCING A SEA BATH IN YOUR OWN ROOM.**

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**LEWIS, ABEL,** Photographer, Douglas. Marine Views of th of Man.

**MOORE, A. W., ESQ.** 3 Charts, showing result of Meteorol Observations.

**TELLET, F. S.,** L.K.Q.C.P.I., Ramsey. (1) Great Britain's Co Pilot, being a new and exact survey of the Sea Coast of England and Scotland by Greenvile Collins, Hydrographer in Ordinary to the King's Most Excellent Majesty, MDCCLXIV.—*Vide* Pepys' "Diary." (2) Map of Harwich, dedicated to Samuel Pep Secretary of Admiralty of England, President of Y° Royall Society, and Maister of Y° House, of Deptford, Stroud. (3) Map of Y° Isle of Man, with view of Peel Castle, de to Y° Rt. Hon. William Earl of Derby, Lord of Y° Isle of Man. (3) A Protection of pooner in the Greenland Trade, March 19th, 1778.

*Secretary in charge of Collection,*

C. T. TOWNSHE

[redacted]

IAN, CANADIAN, AND COLONIAL.

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Newfoundland . . . . . .
New South Wales . . . . . .

[redacted]

# INDIA.

(*See Plan, p.* 140.)

tropical country, such as India, the economic value of well-stocked fisheries depends ly upon two considerations. First whether a sufficient local demand for fish exists, which yield a fair remuneration to the fishermen for their outlay on the necessary gear and r in securing the finny tribes. Secondly, provided such demand is insufficient, whether ties are present which will enable them to send their surplus captures in a marketable tion to more distant localities.

Consequently it becomes necessary first to observe upon what proportion of the people of and Burma consume fish as food, or rather are able to do so without infringing caste dices. In the Punjab comparatively few of the inhabitants are thus prohibited, although mans and the rural population in some places reject it, but among the residents of hilly cts and towns its consumption is only limited by the paucity of the supply and the of the article. In the North-West Provinces, Haiderabad, Mysor, and Coorg, more than the population are permitted by their religion to consume fish. In Oudh the majority so. In Sind nearly all except the Brahmans; in Bombay by far the largest proportion e people; in South Canara 89 per cent.; in Madras the majority, the exceptions being mans, Goldsmiths, high-caste Sudras, the followers of Siva, Jains, &c.; in Orissa more half the people; in Bengal proper from 90 to 95 per cent.; in Assam and Chittagong the entire population, and in Burma in the form of Nga-pee its use is universal.

In investigating how the local markets were supplied with fish up to 1873, the replies native officials gave the following results. In the Punjab one in ten markets were ently supplied, in the North-West Provinces one in three, in Oudh one in four. In y the amount was stated to be insufficient in all and the same reports came from rabad, Mysor and Coorg. In Madras, near the sea, the quantity of fish was sufficient, ly in one out of the ten inland markets. In short merely one-tenth of the bazaars were d as fully supplied with fish, and of these one-fifth obtained them from the sea-coast.

The fishermen in several parts of India, more especially in the Madras Presidency, customs of a patriarchal character, which are more strictly adhered to on the Coromandel on the Western coast, but they appear to be falling into disuse. In Madras there are classes of headmen, the superior or priestly, whose office is hereditary, and he exercises l over large tracts of country; the next is likewise hereditary, his jurisdiction being d to a few towns and villages. The lowest form is elective, and he is over one village or

The sea-fishermen in olden times are stated to have been divided into two distinct classes. those who captured fish in the sea beyond their own depth; and (2) those who fished from ore or in the backwaters, and were more immediately concerned in fish-curing and fish-ng. Remains of these two classes are still existing in Ganjam and elsewhere, but ally the deep-sea fishermen have taken to the cheaper mode of plying their occupation n-shore.

The condition of the sea fishermen in Sind about ten years since, when investigations were owed that they were fairly well off; miserably poor in Bombay, except in the vicinity towns; in a prosperous condition from South Canara down the Western coast of the Presidency, but once round Cape Comorin they again appeared as a poverty-stricken people, and continued so up the Coromandel coast, except when residing near large of population.

sea-board of India and Burmah extends for about 4,611 English miles, and the seas

are much more abundantly stocked with fish than are those of Europe, consequen strange why the majority of the sea-fishermen should be badly off, considerin unlimited inland market for fish which exists. A long investigation led to that the fisheries were in a depressed condition wherever salt was expensive or th of untaxed salt-earth prohibited, as in Bombay, along the Coromandel coast of M Bay of Bengal. That they were flourishing where salt was cheap or the use of earth permitted, as in Sind, the Western coast of Madras and Burma. That w salt-earth could be obtained the superior quality of salt was rarely purchased f That (with the exception of Sind and Burma) where the use of salt-earth was p fish-curer had to dry his fish in the sun, or purchase monopoly salt, while the sel down the cost of this latter description of cured fish was to pay the very lowest for the fishermen's captures and employ a minimum amount of salt.

Prior to considering the incidence of the salt tax upon the fish curers' and fish I would draw attention to the following figures, which show, as far as returns are amount of salted and dried fish *exported* by sea from Indian ports. The valu pounds sterling, calculating 1 rupee at 2 shillings.

| Five years ending | From Sind. Value in £. | From S. Canara. Value in £. | From Malabar. Value in £. | From Coro Coast Value i |
|---|---|---|---|---|
| 1857–58 | 8,472 | No returns. | No returns. | No retu |
| 1862–63 | 13,064 | " " | 26,272 | " |
| 1867–68 | 18,725 | 6,969 | 48,207 | 1,75 |
| 1872–73 | 22,944 | 14,921 | 90,849 | 4,51 |

The duty on salt in Sind has been 2*s.* a maund of 82¾ lb. avoirdupois, sa during the entire period comprised in the above table. The first great increase i occurred in 1860–61, in which year the salt duty was raised in Bombay from 2 maund. The next spurt of this trade in Sind was in 1864–65, when the salt du raised in Bombay from 2*s.* 6*d.* to 3*s.* a maund. Possibly the importations into Sind would subsequently have been more, but Government decided in 1867 to a fish from foreign ports, where no salt duty exists, into British India free of duty, to advantage of the Portuguese settlements and the Meckran coast, but completing Indo-British fishermen and fish-curers unless they were advantageously located.

The following table from different districts on the west or Malabar coast of M the annual sale of Government or monopoly salt, along with the value of the salt fish which were exported by sea:—

| Years. | South Canara. | | Cannanore. | | Tellicherry. | | Travancore Cochin. | |
|---|---|---|---|---|---|---|---|---|
| | Fish. Value in £. | Salt sold. Maunds. | Fish. Value in £. | Salt sold. Maunds. | Fish. Value in £. | Salt sold. Maunds. | Fish. Value in £. | Sa sol Mau |
| 1863—1864. | 1,057 | 191,002 | 96 | 11,653 | 1,459 | 72,505 | 3,419 | [illegible] |
| 1864—1865. | 3,036 | 168,279 | 219 | 7,932 | 1,504 | 57,516 | 6,052 | [illegible] |
| 1865—1866. | 875 | 184,174 | 11 | 9,856 | 194 | 62,135 | 7,983 | [illegible] |
| 1866—1867. | 1,124 | 151,113 | 12 | 9,728 | 1,825 | 57,381 | 1,337 | [illegible] |
| 1867—1868. | 875 | 174,629 | 303 | 8,721 | 2,011 | 56,502 | 7,803 | [illegible] |
| 1868—1869. | 114 | 176,465 | 520 | 9,045 | 4,319 | 63,340 | 1,138 | [illegible] |
| 1869—1870. | 2,053 | 147,173 | 4,340 | 8,807 | 5,829 | 72,616 | 6,096 | [illegible] |
| 1870—1871. | 3,927 | 136,967 | 1,470 | 7,932 | 5,301 | 57,824 | 5,833 | [illegible] |
| 1871—1872. | 2,845 | 177,482 | 695 | 12,008 | 5,340 | 88,674 | 6,947 | [illegible] |
| 1872—1873. | 5,980 | 135,839 | 951 | 6,985 | 8,429 | 77,332 | ? | ? |

The above table shows that the amount of annual exports of salt and dri Western India had very little if any connection with the quantity of monopoly salt disposed of, the explanation being that the people were permitted to use the salt-

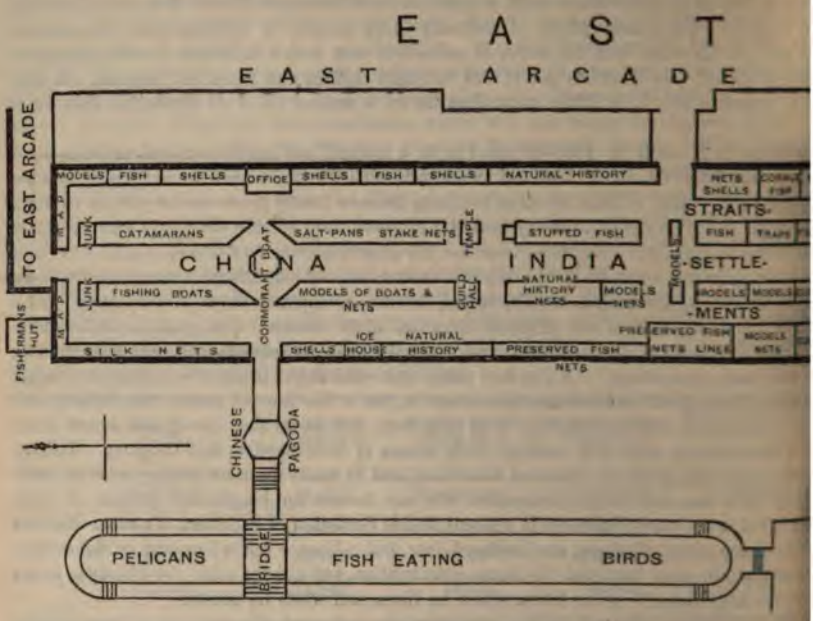
tion of fish as in accordance with a legal decision the natives were free to collect this th for their own consumption. Previously three maunds of fish required 4*s.* worth of ly salt for its cure, but 4*d.* worth of salt-earth was found sufficient for this purpose. ticle produced was inferior, but it was brought within the reach of the poor. It was d to impose a tax of a little more than 3*s.* 6*d.* a maund (R. 1 13 annas) on this salt-

e salt tax in Madras in 1858–59 stood at 2*s.* a maund, but has been raised as follows :— to 2*s.* 9*d.*, 1860–61 to 3*s.*, 1864–65 to 3*s.* 4½*d.*, 1869–70 to 4*s.* 1875 to 6*s.*, but it is now duced to 4*s.* But in Madras some facilities are now being given to the salting of fish. sh-water fisheries differ in many material respects from marine ones, and wherever any y of water is present in the East there we are almost certain to find fishes, and this from vel to nearly the summit of the highest mountains. As a natural consequence fishing d on in rivers, irrigation canals, tanks, ditches, inundated fields and swamps. The n of the fresh waters are divisible into two main classes; first such as follow this as their sole means of livelihood, and secondly such as engage in it only occasionally a subsidiary occupation. Of the first class, even within the limits of a single or at least w generations, great innovations have crept in, for in the time of native rule fishing was hands of distinct castes, but now it is only here and there that one comes across some t of these people, who still restrict their means of livelihood to this industry. British most places has given up taxes on fishermen, and in many districts fishing rents as well ently there are few large contractors who are lessees for lengthened periods of such s, and it is no one's business to prevent undue depletion of fisheries. In some districts eries, or a portion of them, are declared free, but a licence tax is imposed on fishermen. general public may take fish for home consumption, but not for sale. Or liberty is given yone to help himself as he likes, where he likes, and when he pleases.

first the public, pleased at the remission of rents and the removal of restrictions, redoubled energy, and thus augment their immediate profits, the markets become but soon the price declines. After two or three years fish become scarcer, fishing is no munerative, and the misapplied energy eventuates in nothing but small fish remaining ong the artificial causes deleteriously affecting fisheries in many districts are irrigation which are formed by throwing a weir across a river and diverting a large amount of own a main irrigation canal. Fish migrating down rivers pass into these canals nsiderable falls exist, but they can never reascend to the river. Thus these canals enormous fish-traps, wherein all the finny tribes are destroyed whenever the canals dry in order to see what annual repairs are required. Similarly all fish passing into channels, which are generally flooded every alternate week, become killed, as no refuge e in connection with these canals. Sometimes irrigation is carried on by means of g entire rivers into *paddy* fields, in which case all the fry they contain perish.

soon as young fish are moving about, or shortly after the monsoons have set in, men, and children obtain myriads of fry from paddy fields and every sheltered spot to which e retired for shelter and security. Nets which will not permit a mosquito to pass are d; the sides of rivers are denuded of fish so far as human agency can contrive it. icultural population construct wickerwork traps, baskets and nets, first placed so as to the breeding fishes ascending to their spawning grounds, and subsequently reversed to em descending to the river. Streams are absolutely strained to capture the fry, and rigation channel has its wickerwork trap. These devices are too numerous to describe. e minimum size of the mesh of the nets employed in fresh waters is exhibited in the g return :—

| Return from | Size in inches between knot and knot in meshes. | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | 1 inch. | Below 1 inch. | ¼ inch. | ⅓ | ¼ | ⅕ | ⅙ | ⅛ | 1/10 | 1/12 | 1/16 | 1/32 |
| 94 native officials | 5 | 5 | 18 | 5 | 24 | 1 | 5 | 18 | 4 | 2 | 3 | 1 |




And out of 70 more returns 53 officials compared the size of the mesh to a grain of mothi, mucca, gram, dholl, lamp-oil seed, barley, tamarind seed, a small pea, a pepper large needle, a bodkin, quill, coarse muslin, will ensnare a gnat, or hardly anything will

The meshes of nets vary with the season of the year and the growth of the fish are dammed and diverted for fishing; waters are poisoned for this purpose, and many plans are pursued which want of space will not permit me to enumerate.

FRANCIS DAY.

## DIVISION I.

**GOVERNMENT OF BENGAL.** (1) *Nets, with floats.* (a) *sinkers.* *Teār.*—A Net 227 ft. long and 1 ft. 6 in. deep, with a mesh of 4 in. is used for catching *Labeo rohita* in large tanks or in still water. This net is from Chumparun. (2) A fine Floating Net like the *teār*, with grass floats. It measures long and 1 ft. 8 in. broad. It is called *bata jāl* in Chittagong. (3) This net is *teār* of Chumparun. Its length is 150 ft., depth 8 ft. 4 in., mesh 6 in. (4) Another measuring 92 ft. by 8 ft. (5) Another similar, measuring 328 ft. long by 4 ft. mesh 5 in. These nets are from Moorshedabad, where they are known as *sarki* or (6) This is a Net of the same nature as the *teār* and *sarki* and *pakhi*. It measures by 13 ft., and the mesh is 2·50 in. This net is called *dhani* or *dholi jāl* in Nuddea. Net corresponding to the *teār* of Chumparun. It is called *dakon jāl* in Nuddea. Net like the *teār*, made of cotton, and with a mesh of 0·75 in., 142 ft. long, and or deep. This is called *audola* in Cuttack. (9) Small Net of the same

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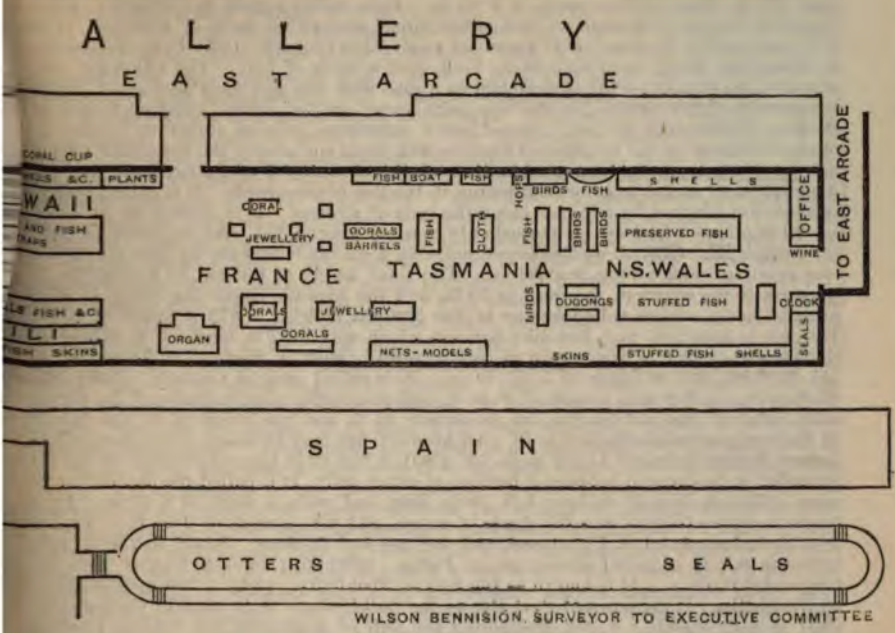


*teār*, measuring 15 ft. 6 in. long and 2 ft. deep, and with a mesh of 1·75 in. It is *pash jāl*, or side-net in the Nuddea district. (**10**) *Kabai Jāl.*—A Net 35 ft. long, 4 in. deep, and with a mesh of 1 in. It is of the same character as the *teār* of parun. At Noakholly it is called the *kabai jāl*. (**11**) A portion of a Floating Net, ring 7 ft. 6 in. long by 6 ft. 9 in. deep, with a mesh of 1 in. It is called *shooli jāl* or *jāl* in Chittagong. (**12**) Portion of a Large Floating Net, 18 ft. 3 in. long, 5 ft. 7 in. and with a mesh of 1·50 in. At Chittagong it is called *dokhanda*. (**13**) A Net 460 ft. gth, 9 ft. deep. The mesh is 9 in., and is used for catching *gochta* fish, a large orous fish found in the northern rivers of Behar and that prefers the colder waters from imalayas. The net is known as the *guchel* in Patna. (**14**) A Float Net 500 ft. long, in. deep, and with a mesh of 4 in. It is called *tewar* in Patna. (*b*) (**15**) *With sinkers.* t of the same character as the *teār* of Chumparun. In Jessore it is known as the āl. (**16**) A Floating Net of the same nature as the *teār*, measuring 127 ft. long and in. deep, with a mesh of 1·50 in. It is called *arrahia* in the Gya district. (**17**) Part eighted Drag Net with three long bamboo floats. It is known at Chittagong as *ber jāl*. *Dewra.*—A Drag Net with a mesh of 1 in., and measuring 50 ft. by 24 ft. In Nuddea net is called *dowra jāl*. (**19**) Part of a Drag Net and measuring 20 ft. by 20 ft. with rical earthen sinkers and gourd floats, and with a mesh of 1·75 in. At Patna this net led *poupounree*, and it is the equivalent of the *dowra jāl* of Nuddea. (**20**) Part of a Net the *pounree* and *dowra*, but with a finer mesh than the former and with *shola* floats. 16 ft. by 18 ft., mesh 0·75 in. It is called *ghunny jāl* in Patna. (**21**) *Kachal.*—A pen Net with a mesh of 1·50 in., and measuring 49 ft. deep by 92 ft. in length. This chiefly used in deep rivers for the capture of *hil'sa*, *Clupea ilisha*, one of the *Clupeidæ* ings), which is famous for the rich flavour of its flesh, and frequents estuaries for the se of spawning. In Nuddea this net is known as the *kachal jāl*. (**22**) A net 99 ft.

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The net is attached to a bow-like bamboo, which may be 7 ft. long.
Chittagong. (28) A Net made of cotton thread, with a mesh of
141 ft. 6 in., and a depth of 5 ft. 10 in. It is called *ghai* at Cutt
*Chella Jāl.*—A Net with a mesh of 0·40 in. and resembling a large han
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fish cannot escape between the weights; diameter 16 ft. 6 in., mesh 2 in
or *jabree jāl* in Mozufferpore. *Bag-like Nets.* (45) A Net made
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*beuti jāl.* (47) This Net is of the same shape as the *boā jāl*, but is mad

. in length, with a breadth of 9 ft. 10 in. at the mouth which has a length from ckwards of 8 ft. 10 in. The far end of the bag or purse is open, and has a of only 11 in. It is called *muna* in Cuttack. (50) A Net 8 ft. 10 in. long and 2 ft. breadth at the mouth and with a mesh of 0·50 in. It is called *bandā jāl* in *loating or fixed wedge-shaped Nets.* (51) A Wedged-shaped Bag Net with a convex d tapering almost to a point at its closed end. It measures 32 ft. along the mouth in depth. The mesh is about 0 50 in. This apparatus is specially constructed for re of the mango fish or *tupsee machee, Polynemus paradiseus,* which is easily caught shes of the net owing to the very elongated rays of its pectoral fins. It is caught in nbers nearly all the year round, and is considered a great delicacy, but it is most in June and July, when it enters the river in great numbers to spawn. From the nnahs. (52) A Net, triangular in form, measuring 70 ft. along the base of the From Moorshedabad. The Bengali name is *bans jāl.* (53) *Screen-like Net* f two parts, one of which is set across the current from bank to bank, and that part sent net is 80 ft. long and 14 ft. deep. This net is known as *kona jāl* in Nuddea. *Nets.* (54) A Net resembling a purse pocket, and closed suddenly by means of a The mouth is 29 ft. long, and when fully open 12 ft. broad, the depth of the net . It is called *khārki jāl* in Moorshedabad. (55) A Net on the same purse principle *ārki jāl.* It is called *sangree* in Nuddea. (56) A Purse Net exactly like the of Moorshedabad and *sangree* of Nuddea. It is called *sooghel* at Patna. (57) A ped Net like the *khārki,* 25 ft. long, 9 ft. deep, and with a gape of 6 ft., mesh m 24-Pergunnahs. Called *jesha jāl.* (58) A Purse-shaped Net like *khārki,* 24 ft. t. 8 in. deep, and with a gape of 6 ft. 8 in., mesh 2 in. Used for catching *hilsa, sha.* Called *shangra* in the 24-Pergunnahs. *Nets on triangular frames.* (59) A r Conical Net fixed by its margin between two divergent bamboos which are kept in position by a short cross bamboo below their point of junction. The net is from where it is called *bisri.* (60) A Triangular Net of the same form nearly as the *bisri* ri, measuring 21 ft. at the base and 13 ft. at the sides, with a mesh of 0·25 in. The lled *besali jāl* in Nuddea, and in it are caught prawns and small fish. (61) ng the *bisri* of Motihari, and used in the same way and for the same purpose. The lled *sitki* in Nuddea. (62) A Triangular Net like the *bisri* of Nuddea, and at the base 10 ft., the sides between 6 ft. and 7 ft., and mesh 0·25 in. It is called in the 24-Pergunnahs. (63) A Model of a Net resembling the *bisri,* but with a et and a wide mesh. It is called *ilsha jāl* in Chittagong. (64) A Model of a Net g the *bisri* and *besali.* It is called *tānu* or *doka jāl* in Chittagong. (65) This Net the *bisri* of Chumparun in being stretched between two divergent bamboos tied ut in its structure the net in having a basal pocket is like the *luhi jāl* of Chittagong, ked from a boat. It is called *tangu jāl* in Chittagong. (66) A Model of the Net *luhi jāl* in Chittagong. It is constructed in much the same way as the *besali jāl.* d measures only 3 ft. along the side and at the base, but some nets have a base of a length of 36 ft. From Chittagong. (67) A Net of the same kind as the *bisali* ut made of string, with a very large mesh about 2 in. in diameter. Only large fish t in it, and its name at Patna is *poute jāl* or *pounti jāl.* (68) A simple Cotton Net between a triangular bamboo framework and with a long pocket behind. It is known *pona jāl* at Patna. (69) A Conical Net stretched on a triangular bamboo framework, easuring 19 ft. 2 in. and the sides a little over 11 ft. It is used for catching small and is called *bisaree* in Patna. (70) A Net resembling the *bisri jāl* of Chumparun, 4 ft. 8 in. along the sides and from the apex to the base 6 ft. 8 in. It is accompanied asket, which is tied round the waist of the fisherman. It is called *paloua jāl* in (71) A Model of another Net resembling the *tanu* or *doka jāl* of Chittagong. d *pelan jāl* in Chittagong. (72) *Thella Jāl.*—This resembles the *bisri jāl* of the n district, but the net is not so loose. At Jessore it is known as the *thella jāl.* et made of Cotton and with a mesh of 0·50 in. and 1 in. at the sides. It is in form. Large fish are caught in this net. In the Mozufferpore district it is *tree jāl. Nets worked on bamboo frames.* (74) This is a Conical Net, which is used f a framework of six bamboos tied together at the apex, and kept in position by a

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bamboo hoop about 4 ft. 9 in. below the apex. The net is from Motihari, and is called [illegible] (75) A small Net, apparently on the same principle as the *kurail* of Motihari. It is [illegible] as *poluha jāl* in Puri. (76) A Conical Net with a mesh of 0·50 in., and measuring [illegible] apex to the border 2 ft. 5 in. The mouth has a diameter of about 3 ft. It is called [illegible] and is a miniature of the large net called *kurial* in Chumparun. From Nuddea. (77) [illegible] Net of the same character as the *chabi jāl*. It is called the *pāhi jāl* in the [illegible] district. (78) A Net resembling the *chabi jāl* of Nuddea, and known as *poluha jāl* in [illegible] (79) A Net 6 ft. 8 in. square, with a short pocket in its centre. It is on the same [illegible] the *kurial*, *chabi*, &c., and is known as the *dharam jāl* in Chittagong. (80) A hoop [illegible] in diameter, supporting a bag-like net 3 ft. in length, and tapering gradually to its [illegible] which can be opened and closed. There is a *septum* about 11 in. from the mouth [illegible] narrow opening leading into the lower part of the bag, so that fish passing beyond it [illegible] find their way out. The mesh is 1 in. It is called *chack jāl* in Chittagong. (80a) [illegible] —A four-cornered Net measuring 4 ft. by 3 ft. 7 in. with a mesh of 1·50 in., and [illegible] catching *Mugil corsula*. This net is called *chatna jāl* in the Nuddea district, and [illegible] Calcutta it is known as the four-cornered net. (81) A Net 2 ft. 1·50 in. in diameter [illegible] around a bamboo hoop. It is used for catching small fish in tanks. It is called [illegible] 24-Pergunnahs *chakni* in allusion to its roundness (82) A Landing Net with 3 in. [illegible] measuring in length 4 ft. 1 in. and a depth of 22 in. From Moorshedabad. [illegible] (83) For the working of this net a complicated arrangement of long bamboos and [illegible] are required. This net is called *khara jāl* in the Jessore district. All kinds of fish [illegible] in it. (84) The fish generally caught in this net are *Labeo calbasu*, *Cirrhina* [illegible] *rohita*, *Notopterus chitala*, and large prawns. It is known as *komār jāl* in the Nuddea [illegible] (85) This is an Hexagonal Frame Enclosure defended above by nets, and with a [illegible] shaped net suspended to it internally. The fish pass in from up and down stream [illegible] being able to find their way out try to clear the lateral screen, and in doing so fall [illegible] saccular or pocketed portion outside the cross bars. As the net is in deep water it is [illegible] by a boat. The mesh of the bag net is 1·50 in., and of the screen net 2 in. It is called [illegible] *jāl* in Nuddea. (85a) *Chand Jāl*.—This Net is only used in shallow water and at night [illegible] as it is frequently used in moonlight nights it is called *chand jāl*. Ground swimming [illegible] caught in it. From Nuddea. (86) A small Net made of the fibre of the stem of the [illegible] the *tār* palm, *Borassus flabelliformis*. Only two kinds of fish are caught in it, viz. [illegible] *cephalus marulius* and *Ophiocephalus etriatus*. It is called *fanshi jāl* in the Nuddea [illegible] (87) A Net resembling the *fanshi* of Nuddea, 31 in. in length, and with a large mesh. [illegible] called *fansa* in Puri. *Deep Sea Nets.* (88) A Y-shaped Bag Net measuring 21 ft. [illegible] from the apex to the middle of the mouth and 51 ft. 10 in. along the arms from the apex [illegible] breadth between the extremities of the arms being 49 ft. The mesh around the [illegible] measures only 0·50 in. and 2·50 in. in the arms. This form of net is used with a [illegible] From Puri. (89) A large Deep Sea Net of a Y-shape, 537 ft. of each arm having a [illegible] 2¼ in. and a breadth of 190 ft. This net, which is not sent owing to its great size, [illegible] smaller net also from Puri, but the bag was more pronounced. From Puri. *Mats for [illegible] Fish.* (90) A Reed Mat used for catching *Mugil corsula*, a surface swimmer, found in [illegible] This mat measures 28 ft. 3 in. × 8 ft. 3 in. It is called *gainti jāl* in the Moorshedabad [illegible] (91) This raft is similar in construction to the *gainti jāl* of Moorshedabad and used for the [illegible] purpose. It is called *burra sirkee* at Mozufferpore. (92) A long, narrow Mat or Raft made [illegible] stems of the jute plant, *Corchorus capsularis*, *Lin.*, or *C. olitorius*, *L.* The white bleached [illegible] of the jute attract the fish, and they jump on to the mat, and as soon as they are on it the [illegible] men who propel the canoe on either end rapidly turn up the raft. It is called [illegible] Mozufferpore. *Fishing Traps made of finely-split bamboos.* (93) *Conical Hand Trap.*—[illegible] Conical Trap, 24·50 in. high, its lower aperture having a diameter of 24·50 in., and its [illegible] opening, of 5·50 in. It is made of split bamboos which are tied together round the [illegible] which constitutes the upper opening, about 5 inches below this point. It is [illegible] in shallow water, and not unfrequently as many as forty or fifty persons—men, [illegible] children—work over a drying jheel. This kind of trap, instead of being conical, may [illegible] a variety of forms, depending on the relative diameter of the hoops used to fit the [illegible] bamboos that radiate downwards from the upper opening. Some are perfectly [illegible]

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hers are much depressed bells of considerable width. This specimen is from Motihari, Chumparun district, and is the simplest form of this kind of trap, and there it is known (**94**) A Conical Trap 2 ft. 1 in. in diameter at the base, and 5·50 in. at the upper , and having a height of 1 ft. 10 in. The workmanship of this is superior to any of er traps of this kind, and the shape is rather elegant. It is called *polo* in the unnahs. (**95**) A Conical Trap resembling the *tapi* of Chumparun and the *polvi* of pore. Height 21·50 in. Diameter at lower aperture 24 in., and at upper opening . In Mozufferpore it is called *tap*. (**96**) A Trap resembling the *polo* and with a r of 2 ft. 3 in. at the mouth, and a height of 1 ft. 6 in. It is called *palo* in Chittagong. he next example is an illustration of the bell-shaped trap of this kind. It is 23 in. nd with a diameter of 26 in. at the lower and 5·50 in. at the upper opening. It is Moorshedabad where it is called *poloi*. (**98**) This specimen is of the depressed ped form, and is also from Moorshedabad where it goes by the same name as the last. ed for capturing mud-frequenting fish. *Scoop-like Traps.* (**99**) A small Trap made bamboos, resembling a truncated cornucopia, with only one aperture, the other end g to a point and held by the hand. This trap is used in Motihari, where it is known as (**100**) A Fishing Scoop resembling the *gānj* of Chumparun and the *honcha* of Nuddea. ufferpore it is also known as *gānj*. (**101**) Of the same type and of the same use as the Motihari. It is called *duri* in Jessore. (**102**) A Fishing Trap resembling the *gānj* of ri. It is called *khainchi* in Puri. (**103**) *Honcha.*—Of the same construction as the d *duri* but the handle is straight. It is known as the *honcha* in the Nuddea district. A Trap resembling the *gānj*, *duri*, and *honcha*. Fish caught in it are removed by hand. lled *hoinchee* in Cuttack. (**105**) A Triangular Scoop, made of fine bamboo mat-work n open mesh. It is called *luhi* in Chittagong. *Platform Traps.* (**106**) A flat work made of split bamboo. It is used in small watercourses that are rapidly , say after a shower of rain. It is called *bhanta* in the 24-Pergunnahs. *Triangular and Traps.* (**107**) A Triangle of Bamboos, measuring at base 1 ft. 11 in. and at s 2 ft. 1 in. The triangle carries a network made of split bamboos, 1 ft. 8 in. long and in. deep at the apex. Small fish and chingries are caught in it. It is used like the *sitkhi ri jāls*, and is called *honcha* in the 24-Pergunnahs. *Cylindrical or partially-compressed* (**108**) A Cylindrical Trap 2 ft. 2 in. long and 1 ft. in diameter at the mouth. It ith its mouth up the stream. It is called *arsi* in Sarun. (**109**) A tube 1 ft. 11·50 in. rth, and slightly broader at the middle than at the ends, which have a diameter 0 in. It is called *dhole* or *hoambu chai* in Chittagong. (**110**) An elongated Conical with an oval mouth, made of finely split bamboo slips and measuring 4 ft. 11 in. in with a diameter of 17 in. ·50 across the mouth. The trap is called *mugura* in Cuttack, chiefly used during the rainy months. (**111**) A laterally Compressed Trap made of amboo and open at one end which is placed upstream. Length 25 in. by 14·50 in. 0 in. From Motihari, where this trap is called *tohka*. (**112**) This is another example kind of trap, but more complicated than any of the foregoing. It is called *doari* in the a district. A variety of small fish are caught in it. (**113**) A slightly compressed ar Trap, wider at the mouth than at the other end, and measuring 21 in. long. It is of me type as the *tohka* of Motihari, and is called *birtee* at Patna. (**114**) A Trap of the onstruction as the *tohka* of Chumparun. It is called *tehoka* in Mozufferpore. (**115**) p less compressed than the *tohka* of Chumparun and measuring 3 ft. 2 in. by 1 ft. 2 in. es from the Jessore district, and is called *doair*. (**116**) *Ghonee, No.* 2.—A nearly Tubular resembling the *doair* of Jessore, but called *ghonee* in the 24-Pergunnahs. *Quadrangular A.—Entrances protected internally by sharp bamboo points.* (**117**) *Aineh.*—A Trap made t bamboos tied together with the fibre of the peduncle of the leaf of *Borassus flabelli-*, but 0·40 in. apart from each other. It is called *aineh* in the 24-Pergunnahs. (**118**) —Another, but smaller, and measuring 1 ft. 9 in. by 1 ft. by 9 in. (**119**) *Aineh.*— er, still smaller, measuring 12·50 in. by 8 in. by 3·75 in. (**120**) Another measuring 1 ft. 1 in. by 10 in. by 10 in. (**121**) Another *aineh* measuring in. by 1 ft. by 7 in. (**122**) An *aineh* measuring 1 ft. 7·50 in. by 1 ft. 6 in. by This differs from the foregoing *ainehs* in having four external openings, but only oor in the inner partition. (**123**) A Trap on the same principle as the *aineh*,

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Called *dhoohna* in the 24-Pergunnahs. (124) *Khora.*—Differs from the *aineh* in hav opening at either end and not being divided in the middle. It is known as in the 24-Pergunnahs. (125) Another *Khora*, measuring 1 ft. 2 in. by 11·50 12·50 in. From the 24-Pergunnahs. (126) *Khora.*—Another. From the 24-Perg (127) *Khora.*—Another, resembling the last in construction, but measuring 1 ft. 3·50 1 ft. 1 in. by 1 ft. 2 in. From the 24-Pergunnahs. (128) *Khora.*—Another, me 1 ft. 2·50 in. by 1 ft. 0·50 in. by 1·50 in. From the 24-Pergunnahs. (129) measuring 19 in. by 12·25 in. by 13 in. with a vertical opening at one end. T comes from Motihari, where it is called *ghana.* (130) Another measuring only 30 19 in. by 5 in. It has a special name in Mozufferpore, where it is called *surjla.* A Trap measuring 16 in. by 15 in. by 9 in. In Jessore it is called *bangy.* A Trap like the foregoing. From Jessore, where it is called *khaduni.* (1 Trap of fine split bamboos measuring 19 in. by 12·50 in. by 13 in. It re the *ghana* of Chumparun, and in Mozufferpore is known as *arsee*; a sc similar trap, but without the long pointed bamboos, being called *rei* in M *With narrow simple openings for fry.* (134) A Trap measuring 13·50 in. by 10 by 7 in. for catching fry. From Motihari. Its native name is *arsi.* (135) A resembling the *arsi* of Chumparun. It is called *hoochna* in the 24-Pergunnahs. Another measuring 1 ft. 3 in. by 11·75 in. by 5·50 in. A Trap resembling the *hoch arsi.* It is called *ghonee* in the 24-Pergunnahs. (137) A Trap measuring 3 19·50 in. by 7 in. It is called *bassā* in Puri. (138) A Trap resembling the *arsi, rabe bilte.* In Cuttack it is called *bhoja.* (139) *Bilte.*—The same as the foregoing, but mea 22 in. by 15 in. by 8 in. Manufactured by Bagdis and Chandals of the Nuddea d where it is known as *bilte.* (140) Another measuring 22 in. by 15·25 in. by 5 Called *rabani* in the Jessore district. (141) Another resembling the foregoing, and *ghuni* in Jessore. (142) A Trap measuring 5 ft. long, and triangular in vertical s the height being 20 in. It is called *dhauli* in Puri. *Traps of various forms.* (14 A-shaped Trap, the sides measuring 2 ft. 4 in. It is called *dhaur* in the 24-Perg (144) *Dhaur.*—Like the foregoing, but truncated. From the 24-Pergunnahs. (14 small Trumpet-shaped Trap let into a short cylinder. It is called *doob* in Chitt (146) A Spindle-shaped Trap made of finely split bamboo. It is called *ra* in Chittagong. (147) A Trap 3 ft. 5 in. in length, 9 in. high, and 5·50 in. in b It has a general resemblance to a miniature toy-house. It is called *dhowree* in Cu (148) A Mat Trap made of the stems of grass tied together by cord. Dr. Day described the use of this trap as follows:—"In Orissa the salwa or pulti consists of fine split bamboos bound together by means of grass, the interstices between each piece equal to ⅛th of an inch or less. This pulti is about 5 ft. high and is in the shape of a re wall net. It is taken to a tank and placed in the water in a V form whilst the fisherm either side extend themselves outwards, and by beating the water drive the fish int enclosure. The two ends are now brought together, and the fish penned into a small The sides are advanced nearer and nearer until they almost touch, and the fish are re by a hand net or by the hand alone." In Cuttack it is called *salwa* or *pulti.* (14 Fishing Screen made of split bamboos tied together. It is called *bar* in the N district. (150) Another measuring 2·8 in. by 1·8 in. Called *pata* in the 24-Pergu *Baskets.* (151) A truncatedly oval basket 12 in. high, with a diameter of 8·50 in. mouth. It is called *khalai* in the Moorshedabad district. (152) A basket for holding made of split bamboo. It is known as *daylee* in the Mozufferpore district. (153) made of split bamboos. Called *daili* at Motihari. (154) A small Basket measuring deep and with a diameter at the middle of 8·50 in. It is called in Nuddea *khalsi.* An elongated Tubular Basket. From Chittagong. (156) A Vase-shaped Basket w short foot. From Chittagong. (157) A round Basket made of bamboo, with its c The basket is called *panjah*, and the cover *dala* in Nuddea. (158) A Fish B made of split bamboo. From Jessore. (159) A small Basket resembling a ... In Nuddea it is called *pete.* (160) A Fish Basket with a conical cover ...

* Fish and Fisheries of India, 1873, page 66.

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and palm leaves. From Puri. **(161)** A couple of simple Baskets, one at each a bamboo, carried in the hand or on the shoulder. From Chittagong. **(162)** ket similar to the last, but with a handle. From Chittagong. *Fishing Rods.* **(163)** g Rod made of a single stem of *Bambusa balcoola*, 14 ft. long and with a diameter of at the handle. No reel is used, and the line is tied to the beginning of the upper f the rod, and is made of cotton, hardened and coloured brown in *gab*. From Moor-b. **(164)** A Rod similar to the last, but with a long cotton line 30 ft., for fishing in er. From Moorshedabad. **(165)** A similar but more slender Rod, 13 ft. 3 in. long 5 in. in diameter at the handle. From Moorshedabad. **(166)** *Barsi, suta* and *sip.*—p 16 ft. 6 in. made of bamboo with a hemp line *suta* and a country hook *bursi*. From **(167)** *Chhip.*—An ordinary Fishing Rod without a reel, and the same as the rods d from Moorshedabad. It measures 13 ft. 8 in. and has a silk line made of *hatjhhara*,* se silk, and is provided with a float of the *rachis* of a peafowl's feather. Nuddea. **(168)** A Fishing Rod 14 ft. long like the last. From Nuddea. Fishing Rod of bamboo ornamented with fire marks and measuring 12 ft. 3 in. he 24-Pergunnahs. **(170)** Another similar Rod, but without a wheel. From the unnahs. **(171)** A small Bamboo Rod 7 ft. 8 in. long, without a wheel. From the unnahs. **(172)** A slim Bamboo Rod, 11 ft. 2 in. It is called *chip* at Patna. **(173)** Fishing Rod and Line. The line is made of the fibre of *Sanseviera zeylanica*.† uri. **(174)** *Fota.*—This curious contrivance is employed in the capture of *Wallago* **175)** *Spring Rod.*—A Bamboo 12 ft. 7 in., set as a spring rod. From Nuddea. *Rope.* **(176)** A rope made of jute for general use. From Moorshedabad. *Lines, Tuggis* or *Lines.*—Two Hand Lines, made of silk and of great length, wound round a er 6·50 in. long and 1·10 in. in diameter, the ends of which are ornamented with lacquer. Each line is provided with two hooks of native manufacture and with a ight. All kinds of large fish are caught with these lines, which are known generally or hand lines. From Moorshedabad. **(178)** Another Line on a wooden reel with d ends. Also from Moorshedabad. **(179)** A Ground Line for catching large fish. own at Moorshedabad as *dhauni*. **(180)** A line consisting of a *ghurnee*, wheel, a piece line, *tuggee*, with its sinker called *seesa*, and its hooks, *bansi*. The line is of English it has been soaked in *gab* in order to preserve and strengthen it. **(181)** A Fishing pared with *gab*, and with one hook and lead sinker, and made of cotton. It is called Patna. **(182)** A much laterally compressed Wooden Reel with a cotton line, and two native hooks. It is called *sherista* in Nuddea. **(183)** A Hand Line wound long internode, 15 in. of a bamboo, ornamented by fire marks and revolving on o stick. From the 24-Pergunnahs. **(184)** A long Cotton Line treated with *gab*. It l round a gourd. It is called *dor* (string) and *bansi* (hook). **(185)** Two Fishing ade of tussah-silk, one with hooks of English manufacture. From Calcutta. **(186)** Fishing Line with large hooks, and with a big iron nail for fixing it. From Puri. smaller Sea Line with hooks. From Puri. *Fishing Spears.* **(188)** A Fishing ade of ten spears tied together for 21 in., the remainder free. It is used in or deep water, and from a dug-out canoe, in spearing all kinds of fish that swim surface. From Motihari. Native name *surhut*. **(189)** A Spear resembling pound spear from the Chumparun district, but consisting of sixteen separate ints, each shaft being 4 ft. 3 in. long. The uses are the same as those of the run spear. It is called *konch* in Nuddea. **(190)** A Spear 4 ft. 10·50 in. long, with oints, and thus resembling the *sarhut* of Chumparun and the *konch* of Nuddea. In pore it is called *sahut*. **(191)** Another resembling the foregoing. From the unnahs. **(192)** A Spear with a coloured bamboo shaft 14 ft. 5 in. long. From the unnahs. **(193)** A Spear with a shaft of blackened bamboo, 10 ft. 10 in. in length. lled *pachkha* at Patna. **(194)** Another with a shaft 10 ft. long, but with eight d points 8 in. long. From Patna. **(195)** A Spear terminating in five singly barbed in. long and fixed into a bamboo shaft 10 ft. long. It is known as *pachka* at *Sarun*.

* Literally, thrown away by the hands.
† Identified by Dr. King, who informs me that the Bengali name is *moogo*.

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curved. From Moorshedabad. *Rod Fishing Appliances.* **(209)** *Fi*
14 in. by 11 in. by 9 in., with five compartments used by Calcu
compartments, a supply of bait, floats, and hooks is carried. In
the Bengali disciple of Isaac Walton stores his food for the day
a paste with molasses, his earthen pipe bowl or *kulika*,
kindling the moist tobacco, and his Bryant and May's matches. Th
carried in the hand. From Calcutta. *General Baits.* **(210)**
substances are generally used as ground baits in Bengal, viz., *gurutt*
*momum; burra methi*, the seeds of *Trigonella fænum græcum*, L.; *khe*
another variety of *T. fœnum græcum*, L.; *khullee* = oilcake; see
*Gossypium herbaceum*, L.; *chura* = a rice paste dried and broken
*Sesamum orientale*, wild; and *chikna matti* = a plastic clay. All th
on the fire, and then pounded together and mixed with clay and wa
highly pungent and aromatic. This bait is either thrown into the
while fishing, or it may be deposited in masses in the water en
driven into the bed of the tank or stream, some feet under wate
slim top of bamboo projects above the water, and being tipped
ments of the latter indicate when the fish are nibbling the bait,
over the spot; the hook baited with a paste of flour and ghee, or de
clay or bread and fresh cheese. In Calcutta some other substances a
consisting of the seeds of the mustard plant, *Brassica juncea; k*
*Nigella satwa;* tambul = the seeds of *Zanthoxylum; chota methi*
*parviflora; akangee*, the stems of *Kæmpferia galanga*, L.; and
*Acorus calamus*, L.; and another consists of boiled rice, chaff, and
*græcum* boiled together. All these ground baits above mentioned are
*Labeo rohita, Labeo calbasu*, and *Cirrhina mrigala*. From Moorshe
**(211)** *Baits.*—The *pupæ* of the large silk-worm moth, called in
considered a good bait for all fish. From Moorshedabad. **(212)**
common in Bengal, and called *kenchoo*, and also *bhuie lanta*, which
From Moorshedabad. **(213)** A small prawn used as bait for lar
*mrigala*. From Moorshedabad. **(214)** Cockroaches also used
predaceous fish. The insect is not impaled, but tied on immediat
the hook and insect are dipped about 3 in. to 4 in. in the wate
**(215)** The young of *Ophiocephalus marulius* and *Barbus stigma* us
Moorshedabad. *Appliances for Ground Bait.* **(216)** A bait made
mixed into a paste and tied on to the stick about 6 ft. from its lo
dabad, where it is called *chár katee*. **(217)** Another and similar

## Division IV.

**OVERNMENT OF BENGAL.** *Boats.* (221) *Botee Boat.*—A ing Boat, 28 ft. long, 7 ft. broad at the middle, and with a depth of 2 ft. at the centre. Patna. (222) A Fishing Boat, measuring 35 ft. 3 in. in length and 5 ft. 2 in. broad at iddle, where it has a depth of 2 ft. 1 in. The general form of the boat recalls the boats e ancient Egyptians. This boat is from Jessore. (223) A Model of the ordinary ing Boat that is used with *behandi* and other nets, and which is generally made about long. From Chittagong. (224) A Model of a Fishing Boat 5 ft. 6·50 in. long and in. broad and 6·50 in. high at the middle. Fishing boats of this kind are generally in length. From Chittagong. *Canoes.* (225) A Canoe dug-out, or *donga*, made of tem of *Borassus flabelliformis*, or *tāl* palm. From Jessore. (226) A Canoe dug out of runk of the tree *semul*, *Bombax malabaricum*, and measuring 23 ft. long, 1 ft. 10 in. broad, 1 ft. deep. It is called *ekta* in Patna, meaning one. (227) *Baling Instrument.*—A den Scoop painted green and margined with red. Length with handle 3 ft. 4·50 in., the being 1 ft. 0·75 in. long and 2·75 in. deep. It is used in baling large boats. From a. (228) Another and similar, but smaller. From Patna. (229) *Fishing Rafts.*—Two ing Rafts, made each of three large bundles of *shola* (*Aeschynomene aspera*, Linn.), 4 ft. long, the breadth of the raft being 4 ft. 3 in. The bundles are tied at the ends, and the are bound together, and over them there are placed two old bhangy sticks, to which are also secured by coarse cord made of jute or cocoa-nut fibre. The fisherman squats with one foot on each piece of wood and steers, and paddles himself with the short oar. raft is used in superintending fishing operations with large drag nets in tanks and in low water, and in throwing the *khepla jāl*, a common casting net. They are known by ther name than *shola*. From Calcutta. (230) A *shola* Float measuring 20 in. by 5·50 in. Puri.

## Division VI.

**OVERNMENT OF BENGAL.** *Raw Materials for making Lines.* 1) Five Masses of Tussah Silk, consisting of the unwindings from the outer layers of ons. Calcutta. (232) Three similar Masses damped and twisted into hanks. Calcutta. 3) Twenty Y-shaped Sticks with the unwindings of the fine inner layer of tussah ons. Calcutta. (234) Twenty Specimens of Lines made of tussah silk. Calcutta. 5) A plant of *Sanseviera zeylanica*, the fibre of which is used at Puri for making ng lines. From Puri. *Apparatus for Making Nets.* (236) *Takur.*—A Spindle and Whorl for making twist for nets. From Calcutta. (237) *Phal-katta.*—Apparatus making nets. From Calcutta. (238) *Phall-katta.*—Two other pieces of better workship. From Calcutta. (239) *Phal-katta and patuna.*—Two other specimens of ller size. From Calcutta. *Materials used in the Preparation of Nets and Lines, for Paying the Seams of Boats.* The preparation is thus made: (240) *Gab.*—The ny juice of the fruit of *Diospyrus embryopteris* is used in tanning, and when it been prepared as follows, the decoction is used for preserving fishing lines and boats nst the action of water. The fruits of *Diospyrus embryopteris*, *D. melanoxylon*, *Acacia ica*, and of *Terminalia citrina* are broken up in the green state and pounded together r with the barks of the following trees, viz. *Acacia arabica* and *Terminalia arjuna*. A water and mustard oil is added to the mixture, and it is then boiled in an earthen l. It is then allowed to stand for two or three days, and after that the liquid is strained r use. A net to be prepared is placed in an earthen vessel and the solution is poured on l the net is allowed to remain in the solution for twenty-four hours. (241) A Sample so prepared. From Calcutta. (242) A sample of the fruit of *Diospyrus embryopteris*. Calcutta. (243) A Sample of the Fruit of *Acacia arabica*. From Calcutta. (244) mple of the Fruit of *Terminalia citrina*. From Calcutta. (245) A Sample of the Bark cia *arabica*. From Calcutta. (246) A Sample of the Bark *Terminalia arjuna*. From tta. *Grass for Tying Traps.* (247) A Specimen of the Grass that is used in tying

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together the fine bamboo splints of which various traps, &c., are made. The grass is su by Dr. King to be a species of *Saccharum*, probably *kushgrass*, *S. spontaneum*. From shedabad.

DIVISION XXI.

**GOVERNMENT OF BENGAL.** *Knife for Cutting Fish.* ( *Bhontee.*—An Iron Blade, 13·50 in. high and 3 in. broad, fixed on to the end of a pi flat wood, to which the blade is placed at right angles. It is called *bhontee*. From Ca (249) *Fisherman's Cooking Appliances.*—A Fire-place used by fishermen for cooking From Calcutta. (250) *Fisherman's Spoon.*—A Spoon made of wood and used in cooking It is called *hattah*. From Calcutta. (251) *Fisherman's Oil Flask.*—A small Earthen for holding mustard oil for cooking. It is called *tali*. From Calcutta. (252) *Lam* leaf-shaped Clay Lamp called *peedeem*, in which a wick saturated in castor oil is bu From Calcutta.

DIVISION XXVI.

**GOVERNMENT OF BENGAL.** (253) *Fish Preserved in B Clupeidæ. Clupea Ilisha.*—Native name *hilsa*, Bengali. (254) The roes of the *hils* prepared in a similar manner. Calcutta Market.

DIVISION XXIX.

**GOVERNMENT OF BENGAL.** *Oil.* (255) Oil made from viscera of *Labeo rohita*. It sells at about eight annas a seer. From Motihari. *Pra Shell Lime.* (256) A Sample of Shell Lime. From Puri. (257) A Sample of Shell l From Puri. *Shells used for Lime.* (258) *Shells—Unio Marginalis, Unio flavidens, Ampularia globosa* are burnt into lime. From Moorshedabad. (259) *Animal Oils.*—A S of the Oil obtained from *Platanista gangetica*, the Gangetic dolphin, and which is h esteemed for rheumatism. From Calcutta.

DIVISION XXXI.

**GOVERNMENT OF BENGAL.** (260) *Pearls.*—These Pearls yielded by the following shells, *Unio marginalis*, Lamarck, and *Unio flavidens*, Benson. shells are found at Bhandardah, *i.e.* store lake, a bheel near Berhampore. A bunch of strings, each string terminating in a red plush knot, containing about twenty inferior p Two strings with 20 pearls each. A string with two large rough so-called pearls sep by a piece of green glass. Coarse pearls. From Moorshedabad.

DIVISION XXXII.

**GOVERNMENT OF BENGAL.** *Playing Cards made of Fish S* (261) *Playing Cards.*—Ninety-six discs made of the scales of the *Mahaseer* fish, *Barb* and used in the game called *gungifia*, which is played by three persons. The car manufactured at Shahabad, in the Arrah Zillah.

DIVISION XXXIII.

**GOVERNMENT OF BENGAL.** *Appliances for keeping Fish a* (262) *Cages. Gaije.*—From Moorshedabad. The cage being too large has not been (263) A small Basket made of finely split bamboo. From Moorshedabad. (264) An 11 in. by 10·50 in. by 8 in. From Moorshedabad. (265) *Ganjia.*—An elongated ba shaped Cage for keeping fish in the water when caught. It is called *ganjia* in the Je district. (266) *Gaije.*—A Cage, 1 ft. 6 in. by 11 in. by 8 in., the same as the cages c *gaije* at Moorshedabad. It has the same name in the 24-Pergunnahs.

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DIVISION XXXIV.

**OVERNMENT OF BENGAL.** *Models.* (267) *Model of a Bazaar.* *Bazaar.*—"This model represents," Mr. Ritchie remarks, "the aspect of a fish bazaar in arket place in Bengal. The hour is between 10 and 11 a.m., and the bazaar is in full g. Sitting all round are the female relatives of the fishermen, who retail the wares, y belong to the fishing castes, Jaliya, Nikeri, and Chandal: the fish in the model are all ful *fac-similes* of the originals. One of the women is cutting off the head of a big *rui* fish, others are bargaining with customers, who include the saheb's servants, as the khansamah, e (in green), and syce (in a blue coat), an old Brahmin, and purchasers of other castes. have passed on to complete the provision for their midday meal from the vegetable to the market. On the outskirts are a Cábuli, who is hawking his stock of warm clothes, a , and the inevitable pariah dog. An idea of the scene will not be complete without ining a Babel of tongues pitched in every key, and indeed the eastern fishwife has a flow nguage quite equal to that of her Billingsgate sister." Made by Ram Lal Pal, Kish- n. (268) Represents a Fisherman (caste, Jaliya) casting a net (*kepla*), the most ordinary of net in use. Made by Ram Lal Pal, Kishnagar. (269) Represents another man , Chandal) fishing with another kind of net called *basali*. Made by Ram Lal Pal, naghar.

DIVISION LI.

**OVERNMENT OF BENGAL.** *Models of Fish.* By Ram Lal Pal naghar. *Mugilidæ.* (270) Mugil. *Ophiocephalidæ.* (271) *Ophiocephalus marulius.* *shal*, Bengali. One of the most common fish in Lower Bengal, and largely eaten by s. *Labyrinthicidæ.* (272) *Anabas scandens.*—The *koi* or climbing fish. It occurs in abundance in Bengal, and is largely consumed as food by the lower classes. *dæ.* (273) *Wallago atto.*—The *boalli.* (274) *Macrones aor.*—The *aor*, Bengali. (275) *dia gangetica.*—The *silond*, Bengali. *Cyprinidæ.* (276) *Labeo rohita.*—The *ruee*, *li.* (277) *Labeo calbasu.*—The *kalbaus*, Bengali. (278) *Cirrhina mrigala.*—The , Bengali. (279) *Catla buchanani.*—The *catla*, Bengali. (280) *Barbus chagunio.*— *arus punti. Clupeidæ.* (281) *Clupea ilisha.*—The *hilsa*, Bengali. *Notopteridæ.* (282) *terus kapirat.*—The *chital.* Preserved Fish. *Percidæ* (*Perches*) (283) *Ambassis ranga.*— throughout India and Burmah. Native name (Bengali), *chanda* or *chandee.* Calcutta *t. Trichiuridæ.* (284) *Trichiurus muticus.*—Seas and estuaries, India to China. e name (Bengali) *kenkeleh.* Calcutta Market. *Sciænidæ.* (285) *Sciænoides pama.*— *d* Bengal and its estuaries. Native name (Bengali) *Koi-bola.* Calcutta Market. *Scom-* . (286) *Scomber microlepidotus.*—Red Sea to Malayan Archipelago. Native name, *amlet.* *tta* Market. (287) *Gobiidæ. Gobius giuris.* East coast of Africa and Sind to Malayan elago on fresh water in plains. Native name, *beliah.* Calcutta Market. *Siluridæ* (*Cat* ). (288) *Callichrous pabda.*—Indus and Ganges. Native name, *pabda.* Calcutta Market. *idæ.* (289) *Harpodon nehereus.*—East coast of Africa to China and estuaries of India. name, *bomelo.* Calcutta Market. *Cyprinidæ* (*Carps*). (290) *Labeo angra.*—Ganges awaddy and Sittoung rivers. Native name *morala.* Calcutta Market. (291) *Barbus* —India and Burma. Native name *gola-pootee.* Calcutta Market. *Clupeidæ* (*Herrings*). *Engraulis taty.*—Seas and estuaries of India and Malaya. Native name *tel-sutkee.* *a* Market. (293) *Raconda russelliana.*—Bay of Bengal and Malayan Archipelago. name *Fasha.* Calcutta Market. *Cyprinidæ* (*Carps*). (294) *Labeo calbasu.*—Rivers *a* and Burma. Bengali name *kalbaus.* Chittagong. *Clupeidæ* (*Herrings*). (295) *lis taty.*—Chittagong. (296) *Clupea ilisha.*—The *hilsa.* Chittagong. *Notopteridæ.* *Notopterus kapirat.*—"Fresh and brackish waters of India to the Malayan Archipe- —*Day.* Chittagong. *Trichiuridæ.* (298) *Trichiurus savala.*—Chittagong. *Stroma-* (*Pomphrets*) (299) *Stromateus cinereus.*—Seas of South-Western Asia. Chittagong *æ.* (300) *Macrones aor.*—Rivers of India and Burma. Chittagong. (301) *Callichrous* —The *pubda*, Bengali. Chittagong. *Scopeleidæ.* (302) *Harpodon nehereus.*—Chitta- *Percidæ.* (303) *Lates calcarifer.*—The *begti.* This fish occurs in the seas of the n coasts of Asia, and is common in estuaries. It is the fish most largely consumed opeans in Lower Bengal. It is frequently preserved with vinegar and tamarind fruit,

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and is then known as tamarind fish. Chittagong. (**304** and **305**) *Pristipoma olivaceum* [illegible] *Pristipoma hasta.*—Common around the coasts of India. The air bladders are collected and [illegible] to the Chinese, who ship them to China, where they are converted into isinglass. Chittagong. (**306**) *Dolphin of the Ganges. Platanista gangetica.*—This remarkable form of Cetacea, which only one species is known, is peculiar to the Ganges, Bramaputra, and Indus, [illegible] is not found in the sea, being essentially fluviatile in its distribution. It ascends the foregoing rivers from their estuaries up to their exits from the Himalayan range, and is widely distributed throughout them and their larger affluents. Its native names are *susu, sunaar, sihoo, hihoo,* and *bulhan. Platanista gangetica* is occasionally accidentally [illegible] in the nets of the fishermen. The flesh and blubber are eaten by some low caste Hindus. The illuminating powers of the oil are said to be high. A very young specimen is [illegible] from the Hughli at Calcutta.

DIVISION LII.

**GOVERNMENT OF BENGAL.** *Reptiles. Crocodilidæ.* (**307**) [illegible] *Gavialis. Gavialis gangeticus.*—This Saurian is nearly exclusively a fish eater, and [illegible] in great numbers in the Ganges and its affluents. It attains to about 20 ft. in length. [illegible] specimens sent alive from the Hugli, Calcutta. *Crocodilus.* (**308**) *Crocodilus palustris.*—This species is widely distributed throughout India. It is not exclusively a fish eater, [illegible] devours all kinds of offal as well. It is especially numerous in Lower Bengal, and during [illegible] rains, the young wander about from stream to stream and tank to tank. It attains to [illegible] length. Two specimens sent alive from the Hugli, Calcutta. *Snakes destructive to Fish. Ophidia. Non-poisonous—Colubridæ.* (**309**) A specimen of the common snake, *Tropidonotus [illegible] cunciatus,* which, although hardly a fresh-water form, is very aquatic in its habits. It is widely distributed over India, Burmah, and Tenasserim. One specimen in alcohol, [illegible] Durbhunga, where it is known as the *dhone. Homal.* (**310**) A specimen of the common form of fresh-water serpent, belonging to the family *Homalopsidæ,* which are [illegible] poisonous snakes. The species is known as *Hypsirhina enhydris,* and is prevalent throughout Bengal, Assam, Arakan, Burmah, and Tenasserim. A specimen in alcohol, from Durbhunga, where it is called *machhgidhi, i.e. greedy of fish. Poisonous. Hydrophidæ.* (**311**) [illegible] An example from the Mergui Archipelago of the poisonous genus *Hydrophis* [illegible] abounds along the coasts of India, Burmah, and the Malayan Peninsula. They [illegible] exclusively on fish. A specimen in alcohol from the Mergui Archipelago. *Living Terrapins and Turtles sent along with the Exhibits. Emydidæ.* (**312**) *Cuora amboinensis.*—[illegible] men from the Nicobar Islands. (**313**) *Emys thurgi.*—Three specimens from the neighbourhood of Calcutta, where the species is common. (**314**) *Emys hamiltoni.*—Three specimens from Jessore. (**315**) *Pangshura tecta.*—One female from Jessore. (**316**) *Batagur lineata.*—One specimen from Jessore. *Trionycidæ.* (**317**) *Emyda granosa.*—One specimen from Jessore.

DIVISION LIII.

**GOVERNMENT OF BENGAL.** *Birds.* (**318**) *The Snake Bird. Plotus melanogaster.*—The Darter, sometimes known as the snake bird, is not at all common in Bengal. It is a large consumer of fish. Two specimens sent alive from the Teesta River. (**319**) *Small Cormorant. Graculus sinensis.*—This little cormorant is as great a fish eater as the Darter, which it resembles in its habits. It is widely distributed over India. Two specimens sent alive from the Teesta River.

DIVISION LIV.

**GOVERNMENT OF BENGAL.** *Animals destructive to Fish.* (**320**) *The Otter of Lower Bengal. Lutra.*—This animal is widely distributed over Lower Bengal and lives exclusively on fish, has a very voracious appetite, and is numerically abundant. Large number of fish are destroyed by it. When caught young, they are very docile and follow their master like a dog. The fishermen in the Jessore Sundarbans take advantage of this disposition, and train the otters to drive fish into their nets, the otter being rewarded with some fish, each time it is successful. These tamed otters have a collar round their necks, and they are secured by it to the prow of the boat, and when [illegible]

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ices are required they are slipped like hounds. Two specimens sent alive from the ore Sundarbans. (321) *The Fishing Cat. Felis bennettii*—This cat is very common in er Bengal about Calcutta. It is generally found in low damp situations, and is said atch fish and to eat shell-fish, such as *Ampullaria globosa*, and *Achatina fulica*. Two imens sent alive from the neighbourhood of Calcutta (now in Zoological Gardens, Regent's k).

DIVISION LVII.

**OVERNMENT OF BENGAL.** (322) *Sketches.* Three water-colour tches illustrating the manner in which the *khepla* is thrown. Artist, Mittanund Dey.

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DIVISION I.

**THE GOVERNMENT OF MADRAS.** (324) Divi fishing line. 5) Ditto. (326) Line made of the fibre of *Calotropis gigantea*. (327) Cotton Lines for p-sea fishing. (328) Another, with hooks, etc., complete. (329) Line for catching *gnemus* and *Lates calcarifer*. (330) Line for shore-fishing. (331) Divi Fishing Spear del). (332) Divi Rod and Line, with artificial bait. (333) Malabar Puffing Tube. 4) Crab Net.

DIVISION IV.

**HE GOVERNMENT OF MADRAS.** (335–336) Divi fishing-boats el). (337) Madras Catamaran. (338) Catamaran, with crew (model). (339) Masula (model). (340) Tuticorin fishing vessel. (341) Masula Boat, with crew. ) Coracle.

DIVISION V.

**HE GOVERNMENT OF MADRAS.** (343) Coir ropes, for Catas and Masula boats. (344) Fibre of *Crotalaria juncea*, of which nets are made. ) The same in its first stage of preparation. (346) The same in its second stage eparation. (347) The same, in its third and last stage. (348) Specimen, to show he nets are woven. (349) Implement for twisting thread. (350, 351) Implements of (352) Coir Rope, of which large nets are made. (353) Implement for twisting Rope.

DIVISION XVI.

**HE GOVERNMENT OF MADRAS.** (354–355) Rods and Lines lete, for catching Mugil. (356) Rods and Lines complete, for small fishes.

DIVISION XVII.

**HE GOVERNMENT OF MADRAS.** (357) *Kaugathuvalai.* ) *Thevvalai.* (359) *Kavuthavalai.* (360) *Thevvalai* (small). (361) *Kalluvalai.* ) *Uduvalai.* (363) A Sifting-basket. (364) *Kondavalai.* (365) Malabar Dip-net. ) *Pusalavala.* (367) *Vadasila Vala.* (368) *Inapavala.* (369) *Farucha alevala.* ) *Pedda Chiratalavala.* (371) *Teluvala.* (372) *Vutchalavala.* (373) A Drag-net, with all mesh. (374) *Yethuvala.* (375) *Yelluvala.* (376) *Phinga Jhallo* or *Visuree Jhallo.* ) *Munajballo.* (378) *Munajballo* (small). (379) *Phinga galla.* (380) *Pellana.* ) *Haddi jallo.* (382) *Haddi jallo* (small). (383) *Pellana* (small). (384) *Kuttari.* ) *Perkuri.* (386) *Kuri.* (387) *Maipukuri.* (388) *Makkeri.* (389) *Gude.* (390) *Yepe.* ) *Hurkilu.* (392) *Yerupari.* (393) Another, of different construction. (394) *Kodam-* (395) *Sari.* (396) *Velangu pari.* (397) *Dollika.* (398) *Tigala Mava.* (399) *Yesala* a. (400) *Pedda Mava.* (401) *Chinna Mava.* (402) *Vucho.* (403) *Vadu.* (404) *Vadu,* e of bamboos. (405) *Ilaram.* (406) *Iggilayala Mava.* (407) *Mava.* (408) *Korame-* *Vucha.* (409) *Khadano.* (410) *Benda.* (411) *Chaduva.* (412) *Dhovudi.* (413) *Bodo* cho *Goni.* (414) *Samo Guncho Goni.* (415) *Pasalo goni.* (416) *Pulo.* (417) Lines atching Mussels. (418–420) *Tenta.*

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DIVISION XXI.

**THE GOVERNMENT OF MADRAS.** (421) Catamaran Man's (422) Basket made of Palmyra leaf. (423) Spade made of Palmyra wood. (424) Cup of cocoanut shell.

DIVISION XXIII.

**THE GOVERNMENT OF MADRAS.** (425) Model of a Fishers Hut.

DIVISION XXXIII.

**THE GOVERNMENT OF MADRAS.** (426) Basket made of split midribs of Wild Date. (427) Baskets made of the leaf-stalks of the Date (428) *Thuri Pari.* (429) *Thoondu Pari.* (430) *Pari.* (431) Trays for exposing for sale.

DIVISION XLII.

**THE GOVERNMENT OF MADRAS.** (432) Specimens of (433) *Emysrijuga.* (434) *Emyda granosa.* ( ) *Chelonia virgata.* (435) Mang (436) Tuticorin. (437) Madras. (438) *Caduana olivacea.*

**PROVINCE OF SIND.** (439) Specimens of Fish. (440) 32 Specim of Reptiles.

DIVISION XLIII.

**DAY, DR. FRANCIS,** Kenilworth House, Cheltenham. (441) A of Indian Kingfishers under a glass shade, the lower one was drowned, due to its bill been seized by a freshwater mussel, when diving after a fish in the dirty Coom riv Madras.

DIVISION XLIV.

**THE GOVERNMENT OF MADRAS.** (442) *Delphinus* (443) *Delphinus perniger.*

**E. BALFOUR,** Surgeon-General. (444) Model of Catamaran.

**E. J. WARING, C.I.E.** (445) Model of Burmese Snake Boat.

**HALY, E.** Shark's jaw from the Indian Ocean.

DIVISION XLVI.

**PROVINCE OF SIND.** 112 Specimens of Molluscs.

DIVISION XLVII.

**PROVINCE OF SIND.** (1) Sixteen Specimens of Radiata. (2) Th Specimens of Zoophytes.

DIVISION L.

**PROVINCE OF SIND.** Seventy-three Specimens of Crustaceans spirit.

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DIVISION I.

**THE GOVERNMENT OF BOMBAY.** (444) Net for catching lar fish. (445) Net for smaller fish. (446) Net with smaller meshes. (447) *Chogin* Cast N (448) Yedi—or Yeri—Net. (449) Deep sea fishing net made of Hemp. (450) Deep Jál Net. (451) Deep sea fishing net with floats of mangrove. (452) Vaghar Net. (45 *Karal pag* Net. (454) Pera—a cast net. (455) The *Dhōl* Net. (456) Harbour Net m of hemp. (457) Casting Net made of hemp. (458) *Khandala* Net. (459) Akhu—a ho Net. (460) Fishing Spear. (461) Fishing Hook. (462) Long Line with large ho


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ARTHUR HERBERT, A.A.G., Ord.

N.B.—A General Order on the subject will be issued in next month's orders.

ighā cord used in catching fish. **464-466** Handlines with hooks. **(467)** *Mahai* raps. **(468)** *Tokya* Basket Traps. **(469)** *Bokshi* Basket Traps. **(470)** *Mudhya* 'raps. **(471)** *Kolati* Basket Traps. **(472)** Specimen of cord used at Aden for nets. **(473)** A Trap Basket used for fishing in the Aden waters. **(474)** Basket arrying fish, Aden.

DIVISION II.

**GOVERNMENT OF BOMBAY.** **(475)** A peculiar hook used ng crabs. **(476)** A peculiar hook (another sort).

DIVISION IV.

**GOVERNMENT OF BOMBAY.** **(477)** Model of a Fish Canoe lles, Aden. **(478)** Model of a Batel, Aden. **(479)** Model of a Zarsogah Bagrah,

DIVISION VIII.

**GOVERNMENT OF BOMBAY.** **(480)** *Domli* Hemp fibre in reparation. **(481)** Hemp in stage of preparation. **(482)** Hemp fibre. **(483)** *Domli*

DIVISION XXI.

**GOVERNMENT OF BOMBAY.** **(484)** Model illustrating how of the Konkan spin out the fibre required for their nets, also how they dye them. odels of a Fisherman and Fisherwoman as seen in the Deccan. **(486)** Model of a man (glazed). **(487)** Model of a Fisherman as seen in the Konkan. **(488)** Model Fish Incarnation of Vishnu" (Hindu mythology). **(489)** "The Turtle Incarnation and the churning of the Ocean by Gods and Demons" (Hindu mythology). **(490)** a Fisherman selling fish in the Deccan markets. **(491)** Model of a Fisherwoman h in the Konkan markets (4 figures). **(492)** Two Models of Fisherman and Fisher- **(493)** Cap worn by Bombay fishermen. **(494)** Cap worn by Bassein fishermen. o Clasp Knives. **(496)** Malabar striped handkerchief. **(497)** Long Robe worn by en. **(498)** Piece of cloth used for a bodice. **(500)** Waistbelt worn by fishermen. e Bangles.

DIVISION XXVI.

**GOVERNMENT OF BOMBAY.** **(502)** Sixteen Tins of Dried d Fish. **(503)** Two hundred and sixteen specimens of Stuffed fish.

DIVISION XXVII.

**DEN, WILLIAM,** 5 Kenway Road, Earl's Court, London, S.W. mples of Prawn Chutney, from Madras. **(505)** Mustard oil used in making Fish **(506)** Samples or Indian Chutneys, Pickles, Curry Powders, &c. **(507)** Samples ients used in making Curry Powder. **(508)** Poppadums, from Madras (cakes eaten es).

**AN, A.,** Oriental Depot, 17 Ebury Street, S.W. **(509)** Curry Pow- pared Bummaloe Fish or Bombay Duck, Chutneys, &c. &c.

DIVISION LI.

**, Dr. FRANCIS,** Kenilworth House, Cheltenham. **(510)** Collection of 00 species of fishes of India and the East in spirit. Several hundreds illustrated in igures. Also Fishes of India, of Malabar and Yarkand which describe the collections.

DIVISION LIV.

**ERNMENT OF MADRAS.** Live examples of air-breathing fishes, *alus* and *Trichogastu*, at present kept at the Zoological Gardens, Regent's Park.

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***WORKS: LIMEHOUSE, E.***

# CANADA.

(*See Plan, p.* 158.)

THE Dominion of Canada (extending over half the continent of America, washed by th of three great oceans, and having within its confines innumerable rivers and lakes almost unrivalled in the extent and variety of its fisheries.

What are generally known as the Maritime Provinces—Quebec, Nova Sco Brunswick, and Prince Edward Island—have every description of sea-fishes; whilst fis furnish an abundance of food-fish of great economic and commercial value, and offe sportsman some of the best salmon and trout fishing in the world.

The great inland province of Ontario, from her vast lakes and rivers, supplies to people, and for export to other countries, large quantities of valuable freshwater fish the new province of Manitoba and the whole of the great North-West Territory have lar lakes and rivers teeming with choice food-fish, which are of great value to the settler fertile region, while the rivers on the Pacific slope in British Columbia are literally salmon.

In a new country, where the machinery for obtaining official statistics is as yet so imperfect, it is difficult to estimate with accuracy the annual value of the fish taken; almost every farmer and settler near the sea-coast, lake, or river, has a boat, net appliances for furnishing his household with fresh fish, no return of which is Government. The benefit of this great boon is especially felt by the settler, who offe from the waters within sight of his new home supplies of rich fish for his fam after his lands yield their rich harvests. The cash value of this widely-distributed to the resident in Canada cannot be reached by the statistician, as his figures deal commercial transactions. The export of fresh fish is principally to the United States.

Of cured sea-fish, codfish, mackerel, herring, &c., large quantities are annually sh the West Indies, Spain, Portugal, Brazil, and other countries. Lobster and sal which about twenty million cans are packed, go mainly to the United States and Great The official returns show annually a steady increase in the value of the fisheries. In reached the sum of $16,088,672.

In some of the older sections of Canada, the former unrestricted fishing of streams with obstructions by mill-dams and otherwise, so resulted in their depletion that the Gov took up the matter, enacted laws for the regulation of inland fishing, provided for the of suitable fish-ladders or passes in mill-dams, and have established eleven fish establishments for restocking and maintaining the supply in the rivers and lakes by means. The extent of fish culture in Canada, under the superintendence of Samuel Esq., may be judged by the output of young fish in the last season, viz.:—Salmon, Salmon Trout, 2,277,000; Californian Salmon placed in Eastern waters, 471,000; Trout, 40,000; Percidæ, 26,500,000; Whitefish, 20,728,000; Total, 55,799,000

In this year's operations there have been placed in the hatcheries—Salmon Eggs Salmon Trout Eggs, 8,350,000; Speckled Trout Eggs, 200,000; Whitefish Eggs, Total, 58,162,000

To which may be added at the proper season twenty million of the Percidæ family total distribution of young fish since the commencement of fish-hatching operations upwards of *one hundred and seventy-five millions.*

Telegraph wires and cables have been laid to the principal fishing stations and on the sea-coast and adjacent islands; and in addition to the ordinary signal service shipping, fishery bulletins are issued and immediate information given of the appear fish at any locality. The sea-coast, rivers, and lakes are well provided with lighthouses official returns of December 31, 1882, show 551 lights and 29 steam fog-whistles and buoys. Seven Government steamers are employed in the lighthouse, buoy and fishery

The Meteorological service is very extensive and efficient, giving weather predi *all the* principal ports. During the year 1882 six thousand five hundred and *predictions* were issued, ninety per cent. of which were fully or partly verified.

W. U. DUNCK, Secretary

ollection of Specimens from the Province of Prince Edward Island was unely detained in the Government Steamer, *Northern Light*, from the 9th of January e 20th of March, and was much injured by this delay, and cannot therefore be d in the condition in which it was shipped. The long voyage of the ship *Latona*, Cape Horn, from Victoria, from the 19th of December until the 12th of May, with tish Columbia Specimens, has greatly injured also the exhibit of that distant e of Canada.

few exceptions the specimens from Canada are shown and owned by the **Dominion nment.**]

e centre of the Canadian Court is erected a large Trophy, representing the Economic nmercial products of the Fisheries of Canada.

form of the Trophy is circular, with a base of 24 feet diameter, and a superstructure of in height. The lower platform contains salted, cured, and pickled fish of various kinds to the markets of the world. Pyramids of original packages and cans of Salmon, rs, Mackerel and other fish, are here shown as put up for export trade from British bia and the Atlantic Provinces. Above these are suspended in circular form Smoked , Dried Cod, and other fish, with a larger circle above hung with native Lobsters in atural and preserved state, surmounted again by more pyramids of canned goods, and ed fishes. Following up the structure is seen a stuffed Beaver, the National Emblem ada, upon whose back rests the great Shield of Canada emblazoned with the insignia of veral Provinces of the Dominion, and encircled by another Emblem, the maple leaf of a. Projecting outwards from this are representative illustrations of fishing implements oven with nets, bunting, &c. Following upwards is the large Blue Banner with da" upon it, and the cross fishes, on the summit is the Crown of England.

here is also in the inner part of the Court a scientific trophy, containing illustrative ens of marine mammals, fishes in alcohol, mollusca, and crustacea.

### Division I.

and Traps of all kinds used in deep sea fishing, including the peculiar Nets used king the porpoise, herring scoops, gear for harpooning whales, trawls, hand lines &c., &c.

### Division II.

Dredges, Tongs and Rakes, Lobster Hoop-traps, Cases, Pots, and Spears.

### Divisions III. and IV.

epresentation of Ice Boats, Dorey full size, Row, Lobster and Seine Boats, Pinkey, ler," Sectional Models of different kinds of Fishing Crafts, Dugouts, &c. (2) Banker, ize and equipped, used in Cod Fisheries off Cape Breton Coast, exhibited by Messrs. ee & Son, Nova Scotia. (3) Gaspe Fishing Boat, full size, used in Cod Fishing off aspe Coast, and on the Miscou Banks in the Gulf of St. Lawrence; containing Nets, Lines, Long Lines, Mackerel Lines, Fishermen's Clothing, &c. (4) Model of l used in transporting the dried and salted fish from the Gulf of St. Lawrence to n markets. (5) Model of the Armed Schooner "La Canadienne," the first vessel yed in the protection of the Fisheries of Canada. (6) Models of various kinds of as used by the fishermen of the Maritime Provinces of Canada are also exhibited.

### Division V.

**ROPE WALK COMPANY, THE** Dartmouth, Nova Scotia.
ge of all kinds suitable for Fishing Vessels and for fishing purposes.

### Division VI.

Horns—System of signalling fishing crafts at night.

### Division IX.

l of Life-Boat as used in Lake Ontario, designed and patented by Mr. J. H. Hatton.

**ANDERSON, ABBOTT, & ANDERSON'S**

**IMPROVED FISHING BAGS.**

STRONG AND WELL MADE.

**37, Queen Victoria St., London, E.C.**

# C A N A D A


PROMENADE
GENTLEMEN
PHOTOS
NETS
NETS
SHELLS
FISH
FAUNA
FISH
HOURS
OIL
DRIED FISH
BEAVERS
CANOE
SHELLS
FISH
PRESERVED
SKINS
PRINTS
NATURAL HISTORY
MODEL
TO MEAT
PICKLED SALMON
NETS
LINES
FISH
TUFFED FISH
HOURS
FISH
STUFFED FISH
LINES
CANVAS
STATES

DIVISIONS XIII. TO XX.

Nets for Salmon, Oolahan Nets, Traps for Eels, Alewive Nets, Hooks, Fishermen's Spears, Sinkers, Floats, Hand Lines, Rods, Flies, Gaffs, Poke and Scoop Nets for , Bass, and Smelts, with Fishing Lines made of Kelp, Cedar Bark and Spruce, 's with "Night-lure" as used by the native Indians in British Columbia. Rods, Reels, and a general assortment of Fishing Tackle are shown by Messrs. Allcock, & Co., Toronto; and the celebrated Trout and Salmon Rods of D. Scribner & Son, an, New Brunswick, are also exhibited. Fishing and Sporting Canoes, made by . Stephenson, English and others of Ontario, are shown in large numbers. Birch-anoes of the Milicete and Micmac Indians. One of these can be seen daily on the little djoining the Canadian Court. Models of Steam Tugs and Sail Boats used in capturing ater fish in the Province of Ontario, and Models of Trap Nets as used in the same ce are also exhibited.

DIVISION XXI. TO XXIV.

men's outfits of all kinds; also contracts of agreement between employer and rée, as used especially in the Province of Prince Edward Island.

DIVISION XXV.

lels of fish-curing establishments. Methods of, and models and other representations liances for drying, curing, salting, smoking, tinning and cooking fish.
s of Gaspe Fish Curing Establishments, by Messrs. Chas. Robin & Co.

DIVISION XXVI.

ii. Fish dried, smoked, cured, salted, tinned, or otherwise prepared for food.
d fish of all descriptions, especially Salmon, from Victoria, British Columbia, Findlay, Durham, and Brodie, John Adair & Co., British American Cannery, British Cannery, Henry E. Croasdaile, Thomas Earle & Co., English & Co., Ewen & Co., & Sons, Inverness Cannery (Agent, H. C. Beeton & Co., 36 Finsbury Circus, n), Laidlau & Co., Richmond Cannery, Windsor Canning Company; and samples eserved Lobsters from the following Firms, of which Henry Howard, 21, Lime , London, E.C., is the sole agent:—Bain, J. D., Chatham, New Brunswick; t, Henry, Alberton, Prince Edward Island; Brown, W. S., Newcastle, New wick; Bulyea, W. H., Alberton, Prince Edward Island; Clark, Robblee & Clark, Sum-le, Prince Edward Island; Gallant, D. D., Cocagne, New Brunswick; Golden Crown ng Company, Halifax, N.S.; McPhail, Neil, Magdalen Islands; Northumberland Packing any, Church Point, New Brunswick; Petitpas, Samuel, Fifteen Point, Prince Edward l; Robichaud and Gagnon, Shemogue, New Brunswick; Young, J. & R., Tracadie, New wick; Young, Robert, Caraquet, New Brunswick; and Samples of Preserved Finnan ies from Thistle Haddi Canning and Curing Company, Digby, Nova Scotia. (2) Codfish s and Tongues, dried and salted. (3) Salted Salmon Trout, Salmon, Herring, Halibut, rout, Fresh Water Trout, White Fish, Alewives, Labrador Herring, Shad, Codfish Sounds Tongues, Eels, Sardines, &c. (4) Boneless Cod and Boneless Hake, specially prepared nce Edward Island and sent to West Indies and other markets, Smoked Salmon, Smoked , Smoked Herring (well known as Nova Scotia Digby Chickens).

**ROBIN, CHARLES, & CO.**, Gaspe, Province of Quebec. Large m, and small-size dried Codfish known as Gaspe dried Cod, prepared for Brazil and erranean markets.

**COLLAS, J. & E.**, Gaspe, Province of Quebec. Small dried Codfish ms, known as Gaspe small dried cod, as prepared for Brazilian market.

**BREMNER & HART**, Halifax, Nova Scotia. Dried Codfish, , Cusk, Haddock, &c., in boxes, as prepared for West Indies markets.

DIVISION XXVII.

eon, Hake, and Codfish, Dried Sounds, specially used in making isinglass.

LADIES' WATERPROOFS
In French Tweeds. Very Light and Elegant.
ANDERSON, ABBOTT, AND ANDERSON,
INDIA RUBBER MANUFACTURERS,
37, QUEEN VICTORIA STREET, LONDON, E.C.

## Division XXIX.

Oils of all kinds, such as Whale Oil, White and Black Porpoise Oil, crude an Cod Liver Oil, crude, refined and prepared for medicinal purposes, seal oil, st &c., &c. Zingler's Patent-Guano from fish offal, from Skæna Riser, British Colum Beeton & Co., 36, Finsbury Circus, E.C.

## Division XXXIII.

**LECKIE, J.**, Toronto. (1) A Fish Carrying Box, on sm wheels, used in Ontario on fishing tugs, and railways for carrying several to fish in ice direct from the fishing stations to distant markets. (2) Two large F preserving fresh fish in a frozen state for any period of time, containing fro caught in June and July 1882, and two large halibut, since March last, one weighi also containing cod, mackerel, bass, trout, cusk, and other fish all in good preservat

**GAUTHIER, C. W.**, Sandwich, Ontario. A Freezer, for fre preserving fresh fish in cakes of ice, containing samples of freshwater fishes.

**WITHEROW & HILLOCK**, Toronto. A Refrigerator, fo fish, meat, fruit, &c. (unfrozen), fresh and sweet for a length of time.

**WILMOT, S.**, Esq. A novel ice-house, built with paper side the Canadian Court, containing some sixty tons of Ice brought from Canada fo the Canadian Freezers and Refrigerators during the Exhibition.

## Division XXXV.—XLI.

(1) A Working Model, showing the exact working of the Government fi establishments in Canada. (2) A Working Section of full size Fish Breedi and Trays, in running operation, in which upwards of fifty thousand salmon eggs hatched into healthy fry during the exhibition. (3) Glass and Metal Fish Ine full operation, for hatching Corregoni and other fish ova of the smaller kinds t eggs, each incubator having a capacity of a quarter of a million of ova. (4) Carriers in various forms, for transporting eggs short or long distances—one of v process of retardation, conveyed the ova safely across the Atlantic which were in the Canadian Court. (5) Fish Breeding Apparatus of all kinds: includin Trays of Glass, Zinc, and Tin, Safety Cans, Perforated Guards, Cans for carr fish long distances, Cleansers, Washers, &c., &c, &c. (6) A Plaster Model o View of a Canadian Salmon Breeding Establishment; showing the freshwater reservoirs for rearing fry, the buildings in which hatching is carried on, and th reservoir in which some three hundred parent salmon are annually kept fro November in a perfectly healthy state. Oil Paintings and Photographs of Hatcheries in Canada. Note.—All the above-named fish-breeding appliances we designed and constructed by S. Wilmot, Esq.

**ROGERS, W. H., ESQ.**, Nova Scotia. A Model, with Dr the latest Canadian invention of a fish ladder or salmon pass, which permits of an u (water) passage for salmon, to surmount dams or other barriers with great success.

**DUVAR, J. H., ESQ.**, Prince Edward Island. Models of Fis

**PRICE, HON. D. E.**, Quebec. (1) A Model, and also a Full- mon Register, for registering, by means of a clock dial, the number of salmon passi or other waters. This register has been in actual use and practically tested with and accuracy in Canadian rivers. (2) Specimens of Acclimatised Salmon from th of the Pacific to the fresh-water lakes and streams of Ontario.

## Division XLII.

**MACOUN, J.**, Prof., Ottawa. A Large Collection of Algæ, according to the various species and localities. Some of these specimens are new and have consequently not yet been named.

**ANDERSON, ABBOTT, AND ANDERSON**
**FISHING HATS AND SOU'-WESTERS.**
**WATERPROOFS THOROUGHLY VENTILATE**
**37, QUEEN VICTORIA ST., LONDON, E.C.**

DIVISION XLIII.

**DAWSON, PRINCIPAL,** McGill University, Montreal. A Dry ction of Sponges.

**HONEYMAN, PROFESSOR,** Curator of the Museum, Nova Scotia. llection, both Dry and in Alcohol.

DIVISION XLIV.

s, in both dry and alcoholic collections. Also Polyps and Jelly Fish.

DIVISION XLV.

**MORROW, ROBERT, ESQ.,** Halifax, N.S. Collection of Entozoa hes.

DIVISION XLVI.

**GOVERNMENT OF NOVA SCOTIA, THE. AND PRINCI- DAWSON.** Mollusca (Dry and Alcoholic).

DIVISION XLVII.

rchins and Holothuria, both dry and alcoholic collections.

DIVISION XLVIII.

olite Aculeata (6½ inches long) and Nereidæ.

DIVISION XLIX.

**SAUNDERS, WM.,** President of the Entomological Society, London, rio. Insects and larvæ of insects which are destroyers of spawn or become food for fish. llection of 40 Cases, consisting of:—(1) Twenty Cases of Lepidoptera. (2) Five Cases of optera. (3) Two Cases of Diptera. (4) Ten Cases of Coleoptera. (5) Two Cases of enoptera. (6) One Case of Hemiptera.

DIVISION L.

**PRINCIPAL DAWSON.** Collection of Crustacea—dry.

DIVISION LI.

ish of all kinds stuffed, some of the skins having stood the test of ten years' exposure with- njury, comprising many of the freshwater fishes of the great inland lakes of Ontario, and of lakes and rivers in Canada, including large specimens of Salmon from British Columbia, lbs. and upwards. Amongst these are acclimatized *Salmo salar* of Lake Ontario and o *quinnat* from the Pacific coast. Salmon Trout, weighing 70 lbs.; Muscalonge, s.; the famous *Corregonus albus*, or White Fish, of Canadian lakes; Herring Salmon; k Trout of 5 lbs.; Pickerel or Dore; Black, White, and Green Bass; Sturgeon and their g, a shovell nosed Sturgeon, 6 feet in length, Winnoniche, Carp, Cat-fish, Pike, Salmon and t from the Lower Provinces; Cod Fish of 68 and 70 lbs., Shad, Mackerel, Herring, &c.; a White Porpoise or Whale, 2000 lbs.; a Greenland Shark, 12 ft. long; and others of the k species of great sizes; Halibut of 220 lbs. and upwards, and various other specimens of and Freshwater Fishes. (2) Skeletons of *Lophius Piscatorius*, the Angler Fish, and of Head of a Cod Fish, exhibited by Robert Morrow, Esq., of Halifax, N.S. (3) A e Collection of Fishes preserved in Alcohol, and otherwise including many of the n fishes of the waters of Canada, scientifically arranged, named, and classified. (4) tings, Drawings, and Photographs of Fishes, by Prof. Fowler, Montreal. Varieties of Fish hown in glass cases, with Photographs of such from British Columbia, also Barnacles and interesting specimens gathered and forwarded by the Marquis of Lorne.

**WATERPROOF COATS, ETC.,**
SPECIALLY PREPARED
FOR
INDIA AND THE COLONIES.
MAKERS,
37, QUEEN VICTORIA STREET, E.C.
**ANDERSON, ABBOTT, & ANDERSON.**

M

## Division LII.

Alcoholic Collection.

## Division LIII.

This collection consists of—(1) *Raptores.* White-headed Eagle and Ospreys (old and yo
(2) *Grallatores,* Coots, Herons, Egrets, Sandpipers, Turnstones, Godwits. (3) *Nata*
Razor-bill, Puffins, Guillemots, Divers (old and young), Loons, &c. Gulls, Terns, Cormo
Gannets, Sea-ducks, Eider Ducks, Sheldrakes, Canvass-back Duck and Golden Eye. I
of these have been lent from the Museum of Laval University of Quebec.

## Division LIV.

Aquatic and amphibious mammalia in large numbers, consisting of taxidermal speci
of Otters, Fishers, Minks, Musk-rats, Weasels, Seals; also the famous White Whale
the Gulf of St. Lawrence (the specimen shown weighing 2000 lbs.), with Basking, Thresh
Greenland and White Sharks, one of the Greenland Sharks reaching the enormous wei
of 600 lbs.

## Division LV.

Maps of Canada with fishing weirs carefully marked. Charts of the Province
Prince Edward Island and British Columbia. Transactions of the Nova Scotia Institu
of Natural Science. Reports of the Fisheries of Canada, and of the progress made in
Culture, with Maps illustrative of the same, also a mammoth map of the Dominion of Can
15 ft. by 30 feet, illustrative of the great agricultural, mineral and fishery sections of the coun

## Division LVI.

Specimens, showing the relation between extinct and living fishes, are shown in
collection of Devonian, Carboniferous, and Post Pliocene fossils, with fishes (Cetacea
Mollusca).

Besides the exhibits specified may be found many others, one of the most attractive b
a complete Milicete Indian Encampment. The rude appliances of the North Ame
Indian for taking fish are shown, while the wigwam of birch-bark is of full size,
complete in every detail that is required to make up the Indian Fisherman's home.
the same terrace are shown the handsome Angler's Tents of the International Tent
Awning Company of Ottawa.

**ANDERSON, ABBOTT, AND ANDERSON'S**
*Waterproof Riding Aprons & Hunting Leggings, and Valises.*
**37, Queen Victoria St., London, E.C.**

# BAHAMAS.

(*See Plan, p. 92.*)

population of the Bahamas by the census of 1881 was 44,000—about 10,000 whites, remainder blacks and coloured. The majority of the population can handle a boat, are a and an adventurous race, and face any dangers in saving life and property.

The fishing-boats are usually of the sloop rig, with a leg-of-mutton sail, and a well for the fish alive. The sponging and wrecking vessels, numbering 500, are of schooner fine models, and fast sailers. They are built by the Islanders, the timbers being of hard wood (horse-flesh), the planking of yellow pine, from North Carolina, and vary tonnage from 15 to 60 tons.

Fish are caught with fish-pots, hand-lines and nets, the nets being taken ou some distance from the land, and hauled slowly in to the shore, when a great variety, many of brilliant and variegated colours, is usually secured. It forms an important article of food, but are exported, with the exception of turtle (*Chelonia Mydas*), and the hawksbill (*Chelonia imbricata*) yielding the tortoise-shell of commerce.

The bait used in line-fishing is usually the conch. The fish are drummed up by the two shells of the conch together, and are ground-baited as in English rivers. During boisterous north-west winds, prevailing between November and February, they are difficult to catch. They are brought alive in the wells of the boats, and thus sold in the market-place. The estimated value of fish used for home consumption is £8000 per annum, and of those exported £600 per annum.

King, queen, and common conch-shells are exported in large quantities, being used for cameos, and in the latter is found the beautiful pale pink pearl now becoming so valued. The annual export is £3000.

Ambergris is also found on these shores, and sea-cucumber (trepang). The annual export ambergris is £1000 per annum.

Corals and small shells, which are very beautiful, are largely collected, and find a ready among the American visitors, and in England.

The value of the sponge exports for 1883 is estimated at £60,000. From a report by the American Consul at Nassau I extract as follows:—"That the sponge-trade gives employment several thousands of persons and some hundreds of vessels, the sponges being divided into coarse and fine, of which the former brings about $5 per cwt., and the latter double that sum. The principal varieties, in the order of their value, are known as sheep-wool, white reef, abaco velvet, dark reef, boat, hardhead, grass, yellow, and glove; and of some of these varieties there are several grades, designated by numbers, all being used for mechanical, surgical, and bathing purposes. Bahama and Florida sponges are about equal to texture and value, but both are inferior to those of the Mediterranean. The vessels employed in sponging are small, with crews of from six to twelve men. About six weeks' provisions are taken on board, and they then coast along the banks and reefs, where the water is shallow, and generally so clear that the sponges are readily seen, and are brought to the surface by hooked poles or sometimes diving. When first brought up they are covered with a soft gelatinous substance as black and full of organic life, the sponge as we know being only the skeleton of the organism. The day's catch is spread out on the deck so as to kill the mass of animal life, which, in decaying, emits a most unpleasant smell. Then the spongers go ashore and build a pen or fence of stakes close to the water's edge, so that the action of the tide may wash away the covering, in which it is aided by pounding the sponges with sticks. When this operation

is completed the sponges are strung upon small palmetto strips, three or four to a strip is called 'a bead,' when they are taken to Nassau to be sold in the sponge-mark certain conditions and regulations, nobody being allowed to sell his cargo otherwi through this sponge exchange. On the conclusion of the sale the sponges are taken packing-yard, where they are sorted, clipped, soaked in tubs of lime-water, and spread dry in the sun. They are then pressed by machinery into bales, containing 100 lbs., this state are shipped to England or the United States, which of late years is alm largest customer for Bahama sponges. The export has been gradually increasing, for in 1874 it only represented $76,500, last year it amounted to $150,000, and the year b $168,000. A new sponge-field was discovered last year at the island of Eleuthera, sixt from Nassau, extending over an area of many miles, and yielding the sheep-wool, th valuable quality. Notwithstanding this fact, there have been two drawbacks to worki field, one being, though the sponges are of a very large size, they are exceedingly te the inner portions, and will not cut to advantage; the other, that at certain times of th myriads of small fish, known as 'sailors,' arrive at the field and stir up the muddy bo such an extent that not a single sponge can be seen."

The sheep-wool sponge brings quite as high a price in markets as the Turkish va the same. The success which is said to have been attained in the artificial propagatio sponge by Professor Oscar Schmidt, of the University of Gratz, may lead to great devel of this industry in the Bahamas. To the late Sir John Lees, father of the present p Governor, the people owe a debt of gratitude for the discovery of the sponge.

In consequence of the number of Islands, harbours are easily made during heavy w and sad cases of distress are of rare occurrence.

Several friendly societies exist for mutual aid in time of sickness.

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DIVISION I.

**CENTRAL COMMITTEE,** Nassau. (1) Sponge Staffs, with l attached, (*a*) Used in obtaining large sponge. (*b*) Used in obtaining smaller spong Four Staffs with Harpoon attached, used in turtle-fishing. (3) Grapnel, with Line att for hooking up turtle in deep water. (4) Two Specimens of Water Glasses. (5) Segm a Turtle Net. (6) Segment of a Fish Net. (7) Fish Scoop. (8) Card containing spe of Hooks and Lines used in deep-sea fishing. (9) Fish Pot.

DIVISION IV.

**CENTRAL COMMITTEE,** Nassau. Models of (1) Fish Smack. (2) Sponging Vessel.

DIVISION V.

**CENTRAL COMMITTEE,** Nassau. Specimens of Rope u by fishing vessels, manufactured from the Palmetto.

DIVISION XXI.

**CENTRAL COMMITTEE,** Nassau. Pair of Palmetto Shoes.

DIVISION XXVI.

**CENTRAL COMMITTEE,** Nassau. (1) Two Kegs of Pick Goggle-eyes. (2) Keg of Pickled Jacks. (3) Case of Dried Bonefish Mullets, Conch A Barrel of *Bêche-de-Mer.*

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**ANDERSON, ABBOTT, AND ANDERSON**

Are the Largest Manufacturers of

WATERPROOF GARMENTS

IN THE WORLD.

87, QUEEN VICTORIA ST., LONDON, E.C. WORKS: LINEHOUSE, E.

DIVISION XXXI.

**FRANCATI & SANTAMARIA,** 65 Hatton Garden, London. (1) ıens of Carved Conch Shells. (2) Cameos—Shell Ornaments.

**FRAZER & HAWS,** 31 Regent Street, London. (1) Diamond Shell roll Head Ornament, with fine Pink Pearl in centre. (2) Pink Pearl and Diamond Pendant. (3) Diamond Heart-shaped Pendant, with fine Pink Pearl in centre. (4) Pink Pearl and Diamond Cluster Centre Bracelet, with Diamond Laurel Leaves on . (5) Fine Pink and White Pearl and Diamond Double Heart Centre Bracelet, nds on shoulders. (6) Large Pink Pearl and Diamond Rose-bud Spray Brooch. (7) Yellow, and White Pearl and Diamond Triple Rose-bud Brooch. (8) Pink, White, and Pearl and Diamond Bouquet and Bird Brooch. (9) Pink and White Pearl and Diamond Brooch. (10) Pink Pearl and Diamond Spray Brooch. (11) Pink Pearl and Diamond n Fly Brooch. (12) Two Pink Pearl and Diamond Rose-bud Spray Brooch. (13) Diamond Butterfly, with Pink Pearl body. (14) Pink and White Pearl and Diamond Brooch. (15) Pink and Black Pearl and Diamond Double Heart Ring. (16) Pink hite Pearl and Diamond Double Heart Ring. (17) A fine Pink Pearl and Diamond r Ring. (18) Pink Pearl Rose-bud Ornament on Gold Locket. (19) Two Pink Pearl bud Brooches. (20) A pair of Pink and Pearl Top and Drop Earrings. (21) A Pink hite Pearl Cluster Ring. (22) A Set of Pink Pearl and Diamond Studs.

DIVISION XXXII.

**CENTRAL COMMITTEE,** Nassau. (1) Case of Turtle Shell lery and Ornaments. (2) Polished Hawksbill Turtle Back. (3) Polished Hawksbill e (young). (4) Cross of native shell work. (5) Basket of native shell work. (6) ontaining Jewellery manufactured from shells and fish scales. (7) Box containing lery manufactured from shells and fish scales.

**SAWYER, R. H., & CO.** Specimens of (1) Sheep Wool or Carriage e. (2) Abaco Velvet. (3) Ordinary Velvet. (4) Reef. (5) Hard Head. (6) Yellow rass. (8) Glove.

**CENTRAL COMMITTEE,** Nassau. Turbot Skins.

DIVISION XLIII.

**SAUNDERS, S. P.** Specimens of curious Sponge Growths.

DIVISION XLIV.

**SAUNDERS, S. P.** Specimens of Corals.

**BETHEL, JOHN.** Specimens of (1) Brain Coral. (2) Branch

**BETHEL, WILLIAM.** Specimens of Brain Coral.

**ROBERTS, ADMIRAL.** Specimen of Brain Coral.

DIVISION XLVI.

**SAUNDERS, S. P.** Collection of Bahama Shells.

DIVISION XLVII.

**SAUNDERS, S. P.** Specimens of (1) Starfish. (2) Sea-urchins. a Fans. (4) Feathers.

**BETHEL, JOHN.** Specimens of Sea Fans and Feathers.

**ANDERSON, ABBOTT, & ANDERSON'S**

FOR GARDEN USE. **HAMMOCKS** FOR TOURISTS' USE.

37, QUEEN VICTORIA ST., LONDON, E.C.

# CEYLON.

(*See Plan, p.* 140.)

## The Fishing Industry of Ceylon.

[illegible] which surround the island contain an enormous quantity and variety of fish; hardly [illegible] in the world has been so richly endowed in this respect by nature as Ceylon.

[illegible] list of the commoner kinds of fish taken will be found in Tennent's 'Ceylon,' fifth [illegible], vol. i., pp. 205–232, and subsequent information on the subject will be found in Day's [illegible] of India' (London, 1878), Blecker on 'Certain Varieties of Fish in Ceylon' (Leyden [illegible]

[illegible]ormerly all the fisheries were a Government monopoly, and in 1840, when the monopoly [illegible], the value of the fish caught was £48,210. Since that date no statistics have been [illegible]ed, but it is probable that the present annual value of fish caught is at least £150,000, [illegible] is rapidly increasing.

[illegible] few shark fins are exported to India, and some bêche-de-mer (*Holothuria*) to China, [illegible] worth (£1200) being sent last year. Except these the only fishery products sent from [illegible] to foreign markets arise from the two remaining Government monopolies, viz., the [illegible] fishery in the Gulf of Maunar, and the Chank (*Turbinella pyrum*) fishery off the north-[illegible]n coast.

[illegible]he former, which occurs at irregular intervals, yielded to Government £50,000 from [illegible]en millions of oysters in 1881, and the latter gives a steady revenue of about £400 a [illegible]rom a million shells worth, about £1000; nearly all are exported to India. Both these [illegible]es are performed by divers, and a description of them will be found in Tennent's [illegible]n,' vol. ii. In the same locality is found the dugong (*Halicor dugong*) a remarkable [illegible]n whose semi-human appearance gave rise to the myth of the mermaid.

[illegible]he Maldive Islands, under the protection of Ceylon, maintain a large fishing industry [illegible]ield considerable exports. Last year they exported to Ceylon 1600 tons of dried and [illegible] fish, worth £27,000, and a considerable quantity of tortoiseshell and cowries.

[illegible]ndia also sent to Ceylon 2800 tons salt fish, worth £47,000.

[illegible]This salt fish is used all over Ceylon as a relish with curries by the natives, and the [illegible]eshell from the Maldives and Singapore is worked by native artists into tasteful jewel-[illegible]which finds a ready local sale. The cowries are exported to India, where they are used [illegible]d of small coinage.

No ships of any size are used in the fisheries; the boats in use are—

*Ballams*, which are large logs burned or hollowed out.

*Canoes*, which are logs hollowed or burned out, having an artificial superstructure [illegible]ed, and an outrigger.

*Katamarans* or rafts of logs tied together.

All these are fitted with sails, but they seldom carry more than five men.

*Peda boats* are of larger size and consist of two hollowed-out logs united by a plank [illegible], with a plank superstructure attached. These boats will carry large nets and as many [illegible]teen men.

The number of boats used in the fisheries is not less than 6400; their manufacture is [illegible]ar, as they contain no nails, all the joints being strongly sewn together with fibre and [illegible]aulked. This fact long ago attracted the notice of the Arabian navigators, and forme[illegible] [illegible]asis of one of the episodes in the story of "Sinbad the Sailor." The nets are often [illegible]rge and costly, some being worth £150.

[illegible]e whole of the coast round Ceylon swarms with fish. Perhaps the most productive [illegible] is the southern coast—the south-western coast is the most assiduously fished, as the [illegible]t population is found there. The thinly-populated coast on the north-east is fished [illegible]lly by a fleet of boats which starts from Negombo, twenty-four miles north of Colombo, [illegible] year about April; the fish caught are salted on the nearest foreshore, and the fleet [illegible] them back in October.

Dried and salted fish are universally consumed by all classes of natives all over Ceylon. Fresh fish find a ready market on the sea coast, but the want of means of quick transport inland confines their consumption to a distance of a day's journey from the coast.

The number of fishermen returned in the census of 1881 was 19,930, besides 1927 fish-mongers and 334 workers of tortoiseshell.

The fishmongers are many of them hawkers who buy the fish in market as soon as the boats come ashore, and convey it inland for sale.

When all the fisheries were a Government monopoly (1796–1840) the Colonial Government used necessarily to take a more active part in their management and regulation than it does now. At present, with the exceptions already noticed, the fisheries are entirely free and untrammelled, but Government provides market buildings at all the important fishing ports.

In 1866 the Government passed an Ordinance to prevent the wanton destruction of fish, and in 1872 another Ordinance (No. 23) empowering village communities to make rules for the local regulation of their fisheries, of which many villages have taken advantage. The Government still appoints certain headmen who exert considerable influence amongst the fishermen.

The fishing industry is almost entirely in the hands of a peculiar caste called the Kavoiyr, *Kavoiyr*, or fisher caste, a considerable portion of which has joined the Roman Catholic Church. These continue to devote to the Church the tithe of fish which they formerly rendered to Government. Caste feeling and the influence of their priests and headmen supplies the want which co-operative and benefit societies are designed to fulfil among Western peoples. The fishers are all closely related. Every large net or boat, and almost every garden near the sea, is owned by several owners in common shares, and where such fishing ground is small in area each net in the village is registered and drawn over it in appointed turn. The fisher caste is by no means confined to its hereditary calling; it also contains some of the wealthiest and most enterprising traders in the colony.

The most pressing want at the present time is the establishment of large fish-curing industries at the most important centres; these would in time not only render Ceylon independent of the import of dried fish, but place the colony in a position to export it, and thus give rise to a trade which would be of the utmost advantage.

The prescribed limits of this paper preclude a detailed description of the contrivances often very extensive and ingenious, in use for the capture of fresh-water fish on the mainland and for the same reason all attempt to describe the remarkable peculiarities and habits of some of the local species of fish has been omitted. Some of these will be found described in Tennent's 'Ceylon.'

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## Division I.

Model No. 9. Sinhalese, Karakgediya. Tamil, Karappu. A circular wickerwork coop, about 3 feet in height and about 5 feet in circumference at the bottom; the circumference diminishes towards the top, where it is only sufficiently large to admit a man's arm. It is used in shallow water, and principally at night. A torch, or chool light, is carried in a hand while the coop is carried by a man wading in the water, who, when the fish, attracted by the bright light, come near, drops the coop down on them, and then withdraws them through the opening at the top. Model No. 10. Sinhalese, Iratiya. Tamil, Min pidipei. This is a trap somewhat similar to the "Karakgediya," but with no opening at the taper end. At the end is a contrivance with a trap door, allowing easy entrance but difficult exit. It is fixed in the narrow channels where water is drained from one land to another. Model No. 11. Sinhalese, Kumbala Dela. Tamil, Kumbala Wali. This net is about 100 yards long and 6 yards in depth. It is cast about four miles out at sea, to catch a species of fish called Kumbala.

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the size of herrings. Model No. 12. Sinhalese, Suda Dela. Tamil, Sudar Wali. about 45 yards long and 6 yards in depth. It has a bag or noose at each of its . It is taken by boat about 30 yards out to sea, whence two men swim ashore h end of it. It is then hauled up on to the beach. Model No. 13. Sinhalese, ela. Tamil, Chithippu Wali. This net is 125 yards long and 7 yards in depth. 4. Sinhalese, Athanguwa. Tamil, Pari. A species of landing-net. Used also prawns in the mud of lakes. Model No. 18. Sinhalese, Wisidel. Tamil, Wisi net is 3 yards in depth and about 6 yards in circumference at its mouth. One o a point and has a long string attached to it. The other end or mouth is heavily th lead, so that when thrown on the water it falls on the surface in a circular hile sinking to the bed of the stream or lake, encircles any fish that may be within he string at the top end of the net then being pulled, the weights are gradually her and the fish enclosed.

## Division IV.

. Sinhalese, Weladan Oruwa. Tamil, Yawāra Thoni. About 20 feet in length used, as its name signifies, for trading purposes. Model No. 2. Sinhalese, uwa. Tamil, Kachchana Thoni. A fishing-boat, mostly used during the north- n, from which it derives its name. Requires a crew of four men, and fishes with ine from between twenty to forty miles out at sea. Model No. 3. Sinhalese, )ruwa. Tamil, Hinguran Thoni. This boat gets its name from the species of enerally used on board it for bait. It carries a crew of seven fishermen, and fishes nd line from five to ten miles out to sea. Net No. 3 is used to catch the particular d; it is 12 yards square. Model No. 4. Sinhalese, Issan Oruwa. Tamil, Iral ihes with hook and line, using prawns for bait, from which it has the name it." Model No. 5. Sinhalese, Laggan Oruwa. Tamil, Surruku Wali Thoni. net (No. 5) of about 20 yards long and 40 yards in circumference at its mouth. crew of five men, and catches large shoals of fish not unlike sardines or pilchards. 6. Sinhalese, Kattu del Oruwa. Tamil, Kattu Wali Thoni. Is used for fresh- g only. Derives its name from the net it carries, viz., stake-net (No. 6), so called nner in which it is fastened in the current of a stream. The net is in the shape of rds long, and with a mouth 4 yards in diameter. The mouth is fixed to eight ed in the bed of a stream in a semicircular form, at a distance of 1½ feet apart. h this net is generally carried on at night by torchlight. Model No. 7. Sinhalese, Oruwa. Tamil, Nandu Thoni. This boat is six feet long, and is principally b and prawn fishing in salt-water lakes. Baited lines are attached to long poles ght in the mud. When it appears from the line that a crab has caught hold of the at comes near, and the line is gently drawn towards a net called "Athanguwa" to which the crab is shaken. Model No. 8. Sinhalese, Modduwa Oruwa. Tamil, ioni. Derives its name from a species of large fish called "Modda." It is caught and line, but on account of its weight requires to be taken on board in the net ra," No. 14. Model No. 15. Sinhalese, Kattumaran. Tamil, ditto. This is a scription of raft; it is made of three or four logs of wood, about 6 feet in length and cumference, kept together by pieces of wood run through them in three places, with each piece projecting at either side. Ropes made fast to these ends, passed over side of the raft, keep the logs firmly fixed together. The net (No. 15) used by about 30 yards long and 6 yards in depth, and is usually cast not more than three sea. Model No. 16. Sinhalese Mādel paruwa. Tamil, Kawali pathei. This is a d boat, plied with oars and poles. It derives its name from the Mādel net which it his net is 600 yards in length and 20 yards in depth. In casting this net one end ed on shore, while the other, after the net has been paid out from the boat in a e out to sea, is gradually brought round to the shore at a point about 40 yards where the other end is made fast. Both ends are then gradually drawn together, is being drawn on shore. Model No. 17. Sinhalese, Barudel paruwa. Tamil, lpathei. A flat-bottomed boat, plied with oars and poles. Is named from the net which it carries. This net is 400 yards in length and 12 yards in depth, and is he Mādel, but on a smaller scale.

The Best and Cheapest. First Established 1825.

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# HELIGOLAND.

(*See Plan, p. 76.*)

THE fishing industry of Heligoland is carried on by a fleet of open boats which co

| Description. | No. | Length. | Beam. | Depth. | Draft of Water. | Value. | Remarks |
|---|---|---|---|---|---|---|---|
| | | feet. | feet. | feet. | feet. | £ | |
| Sloops .. .. .. | 31 | 31 | 9 | 5 | 2·3 | 250 | Model in E hibition. |
| Rudder Boats .. | 18 | 28 | 7 | 3 | 1½ | 125 | |
| Middle Boats .. | 21 | 24 | 6 | 2½ | 1½ | 90 | |
| Lobster Boats .. | 114 | 18 | 5 | 2 | 1 | 27 | |

All these boats are built entirely of oak, and are flat-bottomed, to enable t beached, and are sailed with lee boards.

*Rig.*—The sloops are rigged with sprit sail and fore sail, with two jibs; as no bowsprit, a spar is used temporarily for setting the jib, and when running free t rigged out on the beam with the jib set on it. They all carry eight days' provisions two anchors, a hemp cable, and from 7 to 9 cwt. of stone ballast. In case of t being too bad for them to get back, they anchor, take the mast down, and thus ri heaviest gale, one man constantly baling. The other boats are all rigged with stand

*Gear.*—The fish is caught entirely by line; every sloop carries from 15 to 22 of 40 fathoms with 40 hooks. The lines are shot across the stream; the first line to an anchor, which is buoyed; the boat then stands across, veering the lines as each line being bent to the next, and each line having a small anchor to take it to t and keep it there. When the end of the last line is nearly out, the boat anchors a time weighs and works towards the buoy, hauling the lines in as she goes. The bait sand eels, which are principally got on "Sandy Island," three-quarters of a mile from island of Heligoland.

Formerly the fishing fleet consisted of nearly a *hundred* sloops, but by constant los gales it has dwindled down to the present number, of which but 27 are now fit for s

*Seasons.*—There are two fishing seasons, from March to the end of June, and fro to about January, i.e. when the weather necessitates the hauling up of the boats. caught is almost entirely haddock, with a few cod and an occasional turbot.

*Winter.*—In the winter the fishing is carried on in company. The fish is b the island and delivered to an agent, who has it cleaned and packed, to be for steamers, which are sent over on receipt of telegrams by the contractor on the conti autumn fishing for the last five years has yielded an average of 171,000. The hig was 1880, with 368,700 haddock and 1,266 cod; the lowest 1881, with 58,300 haddoc cod, calculated at *seven* score the hundred, the average price paid by the contract the above period being £1 3*s.* per hundred (140) haddock and cod 1*s.* each.

*Spring Fishing.*—In spring the boats generally take their own fish to such m the opposite coasts, often from the fishing grounds themselves; it is therefore very d arrive at a correct calculation of the season's catch, as well as to estimate the realized, no data having been kept. Prices, however, I find vary from 15*s.* to £ seven score.

*Summer.*—In summer there is little or no fishing carried on beyond what is n supply the wants of the restaurants, &c., most of the fishermen being employed in which takes the visitors over to bathe at Sandy Island, and in boating along with th

*Lobsters.*—From 20,000 to 30,000 lobsters are collected annually on our rocks season being from the 13th June to the 13th September. These are stored in lobst

:en as many as 200 each, the fish being either for local use, or are sent to the ere Heligoland lobsters are greatly prized. It is estimated that to obtain these obster pots (model to be seen with sloop) are in use, value about 4*s.* each. The › which we are so subject do great injury to these pots, so that the occupation is rative as it would seem. The average price realized for lobsters per lb. is from

-The Heligoland Oyster Bank is let to a contractor; it is fished from September he sloops, aided by rudder boats, on a bank about three miles to the eastward of edges being used. It has yielded but 130,000 of late years, mainly owing to between the contractor and the fishermen. The price paid is 7 marks per vered to the contractor's agent in the island.

*grounds.*—The Haddock fishing grounds are from the N. through W. to S.E. of from eight to forty miles from it.

ıters are caught on the reefs that extend N.S. and W. of the Main and Sandy stance of about four miles.

*sh.*—The Heligolanders live almost entirely on fish, a meat meal being of rare Fish is not used as manure, neither is it cured for export or for sale.

*n.*—By last census there were 307 returned as fishermen; the entire population, d be almost included (out of the bathing season) in this category, as old men and n preparing lines, &c., which are cleaned, carried, and baited by the women.

*Aid.*—No special action in aid of fishermen, on the part of the Colonial is possible in the present impoverished state of its finances.

*ocieties.*—When our fleet was nearly destroyed in 1878 a subscription was started n aid of the fishermen, which realized £1535; from this loans without interest the sufferers. The balance with the interests thereon and the repayments as s now to £840, which sum is allowed to accumulate till it reaches £1000, when he capital of an assurance fund or benefit society started at the same time to add uture disasters; to it the fishermen contribute:—

fishing: for each 100 (7 score) of fish 1 M.=1 shilling; 100 oysters 5 Pfennig,

ıhing: each sloop, 15 shillings; each rudder boat, 12 shillings; each middle boat, ach lobster boat, 4 shillings.

ount subscribed up to date is £460 10*s.*; the amount spent in particular aid, hand, £8.

he society dissolve, then the money is to be divided among the subscribers, with of the capital of £1000, which is to remain for ever at interest for the benefit of and their widows.

*emarks.*—Though the waters of the North Sea abound in fish, and often fleets of English, German and Dutch smacks are in sight of the island, the Heligo-gh yielding to none as fishermen, cannot participate in the riches which God has eir door, for without a harbour they can but use vessels such as can be hauled up er, and therefore such as preclude them from going far to sea to earn their daily

T. O'Brien, Lieut.-Col.
*Governor.*

---

Division I.

ɜ, **HILMER**, Heligoland. Fishing line in tray, complete.

Division II.

ɜ, **HILMER**, Heligoland. (1) Lobster Pot. (2) Model of a

Division IV.

**RS, PAUL A.**, Boatbuilders, Heligoland. Model of a Heligoland e with all necessaries for fishing.

Division V.

**IES, H.**, Heligoland. Buoy, invented by the Exhibitor.

# JAMAICA.

(*See Plan, p. 76.*)

[*Up to the time of going to Press with the Second Edition, the Official Introductio to the Exhibits from Jamaica had not been received.*]

(1) Map of Jamaica, prepared from the best authorities—under the direction of M General J. R. Mann, R.E., Director of Roads, and Surveyor-General—by Thomas Hank Government Surveyor, Kingston, Jamaica, 1873. (2) Collection of Stuffed Fish. (3) W Colour Paintings of Sea Fish, prepared by Mrs. Curtis, of Kingston. (4) Case of Cam of Green Turtle and Hawk's Bill Turtle. (5) Two Cases of Manufactured Tortoise Sh Exhibited by Edward Andrews, 215, Tower Street, Kingston, Jamaica. (6) Case of Sun-d Green Turtle, Callipee, Calapash, and Prepared Dried Skin, Bottle of Green Turtle Fat, bottle of pure Turtle Oil. Prepared by Mrs. E. Murray—Auld. (7) Case of different sa Bathing Sponges. (8) Model of a Canoe. Exhibited by Inspector Rivett (Jamaica C stabulary), sent from Sav.-la-Mar, Westmoreland. (9) Model of Fishing Canoe, in general on the coast, made by E. Sullivan, pilot and fisherman, of Bull Bay, St. Thomas in the E It is usually hewn out of the trunk of the silk cotton tree, and the cleats, &c. are of cabb wood. Three men are the number commonly employed on fishing expeditions, the c being worked with paddles or a sail. (10) Model of Fresh-water Fishpot, for taking sn snook, &c. Presented by Sub-Inspector Rivett, parish of Westmoreland. (11) Withes t for mooring fish pots. Presented by Sub-Inspector Rivett, parish of Westmoreland. ( Model of Single-funnelled Fish-pot. Made by Sullivan, Bull Bay, out of split bamboo. ( Model of Double-funnelled Fish-pot. Made by Sullivan, Bull Bay, out of split bamboo.

**WATERPROOF FISHING COATS,**

TO SHORTEN AT PLEASURE, AND WITH INNER CUFFS
TO PREVENT WATER RUNNING UP.

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# NEWFOUNDLAND.

(*See Plan, p.* 176.)

Island is situated between the parallels of 46° and 50° north latitude and the meridians of and 59° west longitude, at the mouth of the Gulf of St. Lawrence, and has an area of 42,000 miles, with a coast line of over 2000 miles.

has also belonging to it the Labrador territory, with a coast line of nearly 1000 miles.

Newfoundland is the oldest colony of Great Britain, having been discovered in 1497; it is nearest to the United Kingdom, being but 1640 miles from the Irish coast.

Along all these coasts are the celebrated fishing grounds to which the fishermen resort in of their avocations.

The island has besides very valuable and extensive mineral resources, which have but been brought to light, but which promise to become an important source of industry alth. The principal of these are copper and lead; and when the country is opened up, of the railway now in course of construction, it is the opinion of the best scientists, wfoundland will take a leading place among the mineral countries of the world.

## PRESENT VALUE OF THE NEWFOUNDLAND FISHERIES.

principal commercial fishes taken from the waters around Newfoundland and are the Cod, the Seal, the Herring, the Salmon, and the Lobster. The quantities of taken are too small to render them of commercial importance.

Cod Fishery is by far the most important, its products averaging in value three- of the entire returns of the fisheries.

following statement shows the values of the cod-fishery products for the years —1880, exported, $5,309,484, consumed in the colony, $408,000; 1881, exported, 76, consumed in the colony, $384,000; 1882, exported, $5,978,668, consumed in the $480,000. Total exported, $16,830,728; Total consumed in the colony, $1,272,000. value in three years $18,102,728 or £3,771,402 sterling. Average annual value of the of the cod fishery for the last three years $6,034,242 or £1,257,134 sterling.

The following statement shows the value of the codfish taken by the French on that portion Newfoundland coast over which their fishing privileges extend, and is exclusive of their fisheries:—1880, $250,920; 1881, 342,588; 1882, 244,800. Total, $838,308. Average value, $279,436 or £58,216 sterling. The products of the cod fishery above referred to, the dried codfish exported, the common cod oil, the refined cod-liver oil, the roes for bait in the Sardine Fishery, and the dregs. The cod oil is chiefly exported for medicinal purposes.

The following statement shows the quantities and value of these products respectively, for named:—1880, Dried Codfish, 1,419,503 quintals (112 lbs.), $4,826,317; Cod Oil, tuns, $448,300; Refined Cod Liver Oil, 172 tuns, $30,960. 1881, Dried Codfish, 1,583,132 $5,066,022; Cod Oil, 4,127 tuns, $445,716; Refined Cod Liver Oil, 144 tuns, $25,920. Dried Codfish, 1,463,439 quintals, $5,853,756; Cod Oil, 4,254 tuns, $493,464; Refined Oil, 147 tuns, $28,224.

Seal Fishery.—The Seals are taken by the crews of steamers and sailing vessels on the off the north-east coast of the island, and in the Gulf of St. Lawrence, during the of March and April.

following statement shows the number of Seals taken and their value, in the years —1877, 451,678, $1,116,360; 1878, 409,658, $1,006,568; 1881, 447,903, $957,760. mber of Seals, 1,309,239. Total value, $3,080,688, or £641,810 sterling. Average of Seals taken in three years, 436,413. Average annual value of Seals taken in three 1,026,896, or £213,937 sterling.

The products of the Seal Fishery include the Skins and Oil. The former are ex a salted state to Britain, where they are tanned or used by furriers. The Seal Oil, ext steam process, is sent to Britain, where it is largely used in coal mines for illuminati lighthouses. It is also used in the manufacture of the finer kinds of soap and candle

The following statement shows their respective quantities and values in the years 1877, Seal Skins, 451,678, $361,342; Seal Oil, 6,081 tuns, $754,044. 1878, Seal Skin $286,760; Seal Oil, 5,992 tuns, $719,040. 1881, Seal Skins, 447,903, $403,112; 4,773 tuns, $553,668.

Herring Fishery.—Herrings are taken all round the Island at certain seas chief centres of the Herring Fishery are Labrador, Bonne Bay, Bay of Islands, S Bay, and Fortune Bay.

Statement showing the value of Herrings exported in the years named:—188 1881, $269,556; 1882, $228,128. Total, $724,630. Average annual value of Herri in three years, $241,543. Average annual value of Herrings taken by the Ne fishermen, and sold to the French and Americans as bait or for food, $100,00 annual value of Herrings consumed in the Colony $240,000. Average annual v Herring Fishery $581,543, or £121,155 sterling.

Salmon Fishery.—Statement showing the value of Salmon exported in the yea 1880, $138,904; 1881, $80,348; 1882, $124,264. Total, $343,516. Average annu three years, $114,505, or £23,855 sterling.

Lobster Fishery.—Statement showing the value of Lobsters exported i named:—1880, $95,712, 1,124,580 lbs. 1881, $111,408, 1,346,240 lbs. 188 1,265,224 lbs. Total, $312,552, 3,736,044 lbs. Average annual value of Lobsters three years, $104,184 or £21,705 sterling. Average quantity taken in three years, 1 Estimated annual value of all other fish taken, $40,000.

Recapitulation.—Average annual value: Cod Fishery, $6,034,242; Se $1,026,896; Herring Fishery, $581,543; Salmon Fishery, $114,505: Lobst $104,184; all other Fish, $40,000. Total average value annually of the fisheries or £1,646,118 sterling.

Countries to which the Fish are Exported.—The countries to which the dried Cod Fish is exported are the United Kingdom, Brazil, Portugal, Spain, States, Italy, Spanish and British West Indies, and the Dominion of Canada. T of the Seal Fishery are sent almost exclusively to the United Kingdom. Lobsters

ishermen have a first lien on the products of each season's fishing operations for wages res.

he following statement shows the extent and value of the French Fisheries on the Banks n the Coast of Newfoundland in the years named:—

| Year. | Men. | No. of vessels. | Tonnage. | Qtls. of Codfish taken. (112 lbs.) | Value. |
|---|---|---|---|---|---|
| 1878 | 7,858 | 181 | 30,350 | 321,411 | £285,673 sterling. |
| 1879 | 7,168 | 177 | 27,865 | 369,628 | 279,697 „ |

**HADDON, J.** (1) A Fisherman's Home, showing dwelling-house, n, and fields. (2) Fishing Schooner and Boats. (3) Stage for Landing, Splitting, and g Fish. (4) Flakes for Drying. (5) Fish Store.

Oils.

**MUNN, JOHN & CO.** Sweet Seal, New Process.
**GRIEVE, W., & CO.** Sweet Seal, New Process.
**JOB BROTHERS & CO.** Sweet Seal, New Process.
**TESSIER, P. & L.** (1) Pale Seal, Vat. (2) Tinged Seal, Vat. rown Seal, Vat. (4) Medicinal Cod Liver.
**HARVEY & CO.** Medicinal Cod Liver.
**MARCH, S., & SONS.** Medicinal Cod Liver.
**M'DOUGALL & TEMPLETON.** Medicinal Cod Liver.
**MUNN, JOHN, & CO.** Cod, used by Curriers.
**GRIEVE, W., & CO.** Cod, used by Curriers.
**TESSIER, P. & L.** Cod, used by Curriers.
**MUNN, JOHN, & CO.** Herring.
**GRIEVE, W., & CO.** Pale Whale.
**BOYD, WM.** Shark.

Seals.

**LIVERPOOL FREE PUBLIC MUSEUM,** Newfoundland Produce y the Committee. (1) Harp (*Phoca Grœnlandica*), Male, Female, Young and Immature. ooded or Bladder Nose (*Stemmatopus cristatus*). (3) Harbour Ranger or Floe Rat ays *fœtidus*). (4) Square Flipper (*Phoca barbata*).
**WHITELEY, WM. H.** (1) Model of Cod Fish Trap, invented by nd first used at Bonne Espérance, Labrador. (2) Seal Fishing Net.
**GOLDER, F. W.** (1) Sealing Steamer "Vanguard," owned by John & Co., Harbour Grace. (2) Sealing Brig "Isabella Ridley."
**GRIEVE, W., & CO.** Sealing Steamer "Lion."

Dried Codfish.

**GRIEVE, WALTER, & CO.**
**JOHNSTON, BAINE, & CO.**
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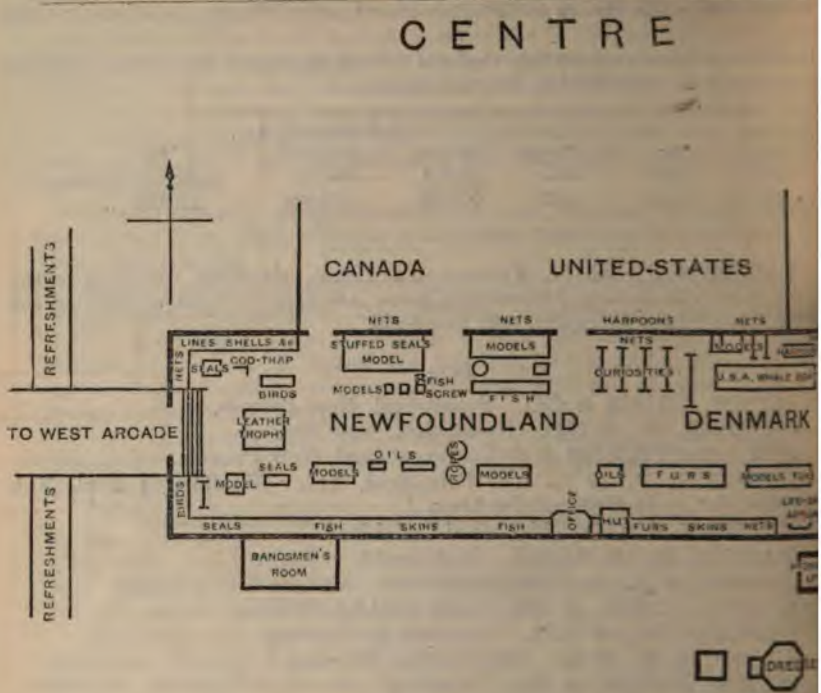



Fish in Spirits.

**NEWFOUNDLAND COMMISSION.** (1) Herring. (
Fish. (3) Salmon. (4) Mackerel. (5) Smelts. (6) Sea Trout, male and female. (
Trout. (8) Ling. (9) Caplin, bait for Cod Fish. (10) Squid, bait for Cod Fi
Lance, bait for Cod Fish. (12) Salmon Trout Eggs. (13) Tom Cods, the young of C
(14) Haddock. (15) Bream. (16) Mussels. (17) Prickly Backs. (18) Cat Fi
Dog Fish. (20) Bill Fish.

**BOYD, W.** (1) Wolf Fish.

**NEWFOUNDLAND COMMISSION.** (1) Bullhead. (2)
Cod Fish (4).

**GRIEVE, W., & CO.** (1) Whale Bone. (2) Tusks of Nar

Models of Fishing Craft.

**BURKE, JOHN.** (1) Bait Skiff. (2) Jack carrying 30
Green Fish.

**MULLOWNEY, STEPHEN.** Western Fishing Boat.

**KEARNEY, MICHAEL.** Western Fishing Boat.

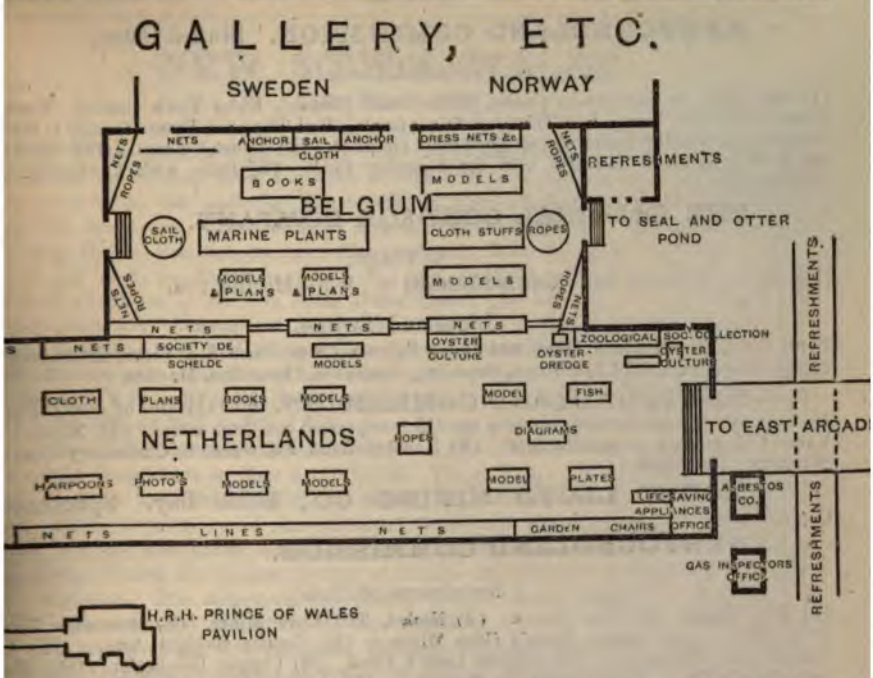
**MULLOWNEY, STEPHEN.** Bank Fishing Schooner.

**O'BRIEN, P.** (1) Labrador Fishing Schooner. (2) Model of
Boat. (3) Whale Boat. (4) Sealing Brigantine.

**STEER, JOHN.** (1) Preserved Lobster in tins. (2) Pr
Trout in tins.

**CHRISTIAN, W.** Preserved Salmon in tins.

**NEWFOUNDLAND COMMISSION.** (1) Specimens
various Shells found on the Newfoundland Coast. (2) Scallop and Crab Shells. (3)
exhibiting various pursuits in connection with the Newfoundland Fisheries—Arm
HAYWARD, JUN. Landing, Heading and Splitting Cod; Salting, Washing and Dry
Hauling a Cod Seine; Hauling a Caplin Seine; Hauling a Herring Seine; Hauling
Trap; Overhauling a Bultow; Caplin Dip, Netting and Casting; Squid Jigging; H




Fishing; Bait Skiff supplying Boats; Salmon Net being set. Barring a Harbour to Herrings; Lobster Fishery in full operation; Newfoundland Seal Fishery, first trip; undland Seal Fishery, second trip; Taking Seals from Frame; Fish Trade Barque; Trade Schooner; Devil Fish attacking a Boat; Batting Young Seals; Cooling Seals; g Old Hoods—Large Old Dog at bay with hood inflated; Swatching and Trolling Old ; Sealers Hauling Seals; Sculping young Seal; Newfoundland Sealer—full dress; ng; A Crow's Nest; Seal Skinning; Bow Shears and Ice Claws; Copying, *i.e.*, running Channel over small pans of ice; Washing Fish in a Ram's-Horn; Ship moored to an g to avoid Drifting in running Ice; A Pan of Seals; Landing Seals; Methods of ng a Channel with Tows of Seals; The St. John's Newfoundland Sealing Fleet leaving hn's, March 10; Green Bay Method of Sealing; Sealing Punt equipped.

**GRIEVE, W., & CO.** Drum containing 128 lbs. Codfish, prepared e Brazil market.

**ANGEL, J.,** Victoria Foundry. Screw Press for pressing dried Fish rums.

**JOB BROTHERS & CO.** Fish Guano.

**LABRADOR FERTILIZER COMPANY.** Fish Guano.

**NEWFOUNDLAND PRODUCE,** lent by the Watt Museum, ock.

Seals.

Harps, Old and Young (*Phoca Grœnlandica*). (2) Hooded, Old and Young (*Stemmatopus ata*). (3) Grey or Harbour Seal (*Pagomys fœtidus*).

**ANDERSON, ABBOTT, & ANDERSON'S**
**IMPROVED**
RIDING OR HUNTING WATERPROOFS,
**WITH LEGGINGS ATTACHED.**
37, QUEEN VICTORIA ST., LONDON, E.C. WORKS—LIMEHOUSE, E.

**NEWFOUNDLAND COMMISSION.** Stuffed Otter.

Stuffed Birds.

(1) Old Wife, or Can-ca-wee (male), Eider Duck (female), Eider Duck (male), Two Northern Divers (Loon), Red Throated Diver (male), Red Throated Diver (female), Sheldrake or Goosander (male), Sheldrake or Goosander (female). (2) Lobster Traps. (3) Otter Trap. (4) Sealing Gun, as formerly used for Shooting Seals. (5) Rifle, with Cartridges, as present used.

**THE COLONIAL CORDAGE COMPANY.**

Cordage.

Coir, 4½ in.; Bolt-rope, 3 in.; Lanyard Laid, 3½ in.; White Manilla, 4 in.

Lines and Twines.

Long Lines, Hand Lines, Hand-laid Lines, Salmon Lines, Deep Sea Lines, Trawling Lines, Signal Halyards, Patent Log Lines, Snooding, Spunyarn, Houseline, Marline.

**NEWFOUNDLAND COMMISSION.** (1) Model of Seal Factory. New process of manufacture, whereby the Oil is expressed free from odour. (2) Model of Vat. Old process of manufacture. (3) Newfoundland Fisherman in Customary Garb. (4) Sturgeon. (5) Shark.

**MOUNT LLOYD MINING CO.,** Little Bay. Specimens of Copper Ore.

**NEWFOUNDLAND COMMISSION.**

Specimens of Ores.

(1) Two Copper Tilt Cove Mines. (2) Nickel, Tilt Cove Mines. (3) Magnetic Iron, Tilt Cove Mine. (4) Copper, Betts's Cove Mines. (5) Copper Rabbits Arm. (6) Copper, Consolidated Mining Co. (7) Copper, Lady's Pond. (8) Copper, Colchester. (9) Magnetic Iron, Lady's Pond. (10) Galma (La Manche). (11) Galma, Great Placentia. (12) Argentiferous Galma, Little Placentia. (13) Manganese, Topsail Head. (14) Coal, St. George's Bay, South. (15) Coal, St. George's Bay, North. (16) Gypsum, St. George's Bay, North.

**STEPHEN, WILLIAM, & SON,** Seal and Whale Fishery Tanners, St. John's, Newfoundland and Dundee. (1) Trophy, showing Seal Skins dressed as Leather and Furs; also Porpoise Leather, and ornamented by stuffed specimens of Animals, with the Implements used in the capture and dressing of same. (2) Also specimens of Seal, Whale, and Porpoise Oils. (3) Whalebone and other produce of Seal and Whale Fisheries.

**KNIGHT, SAMUEL,** Harbour Grace, Newfoundland. Design for a Life-boat, with descriptive text.

**TREADWELL, W. C.** (1) Preserved Salmon in tin. (2) Preserved Lobster in tin. (3) Preserved Sea Trout in tin.

**FORSEY, G. & C.** Preserved Lobster in tin.

**KENNEDY, CAPTAIN, R.N.,** Newfoundland. (1) Group of Ptarmigan, showing their plumage at different seasons. Sixteen specimens. (2) Head of Caribou Stag ("Brigham Young") of Newfoundland; killed by Exhibitor.

**KEARNEY, MICHAEL,** St. John's, Newfoundland. Model of Ship's Life Boat.

**CAMPBELL, J.,** St. John's, Newfoundland. Specimens of Seal Skins dressed as Leather and Furs.

**ANDERSON, ABBOTT, AND ANDERSON'S**

LEATHER LINED **FISHING BOOTS** REQUIRE NO DRESSING.

**37, Queen Victoria Street, London, E.C.**

# NEW SOUTH WALES.

(*See Plan, p.* 140.)

ALES exhibits chiefly a large collection of the Fishes of the Colony preserved in are all *food fishes*, and such as from time to time at various seasons of the year to the fish markets. The number of species exceeds 150 kinds, and are repre- specimens. The freshwater species, such as the Murray Cod, and various kinds ream, Herrings, &c., are well represented. A catalogue, now in preparation, and ready for distribution in a few days, contains a detailed list of these fishes *atalogue of the New South Wales Court*), and also notes on a fine Collection m Port Jackson and the adjacent coast. A Collection of *Echinodermata* and *phytes*, &c., and Polyzoa from the same localities. A group of Eared Seals, *inereus*, consisting of adults and young, is exhibited on the left of the entrance Two well prepared specimens (male and female) of the Dugong, *Halicore* oil and lard obtained from these strange animals, are also exhibited. In the exhibited, besides the stuffed fish, a large collection of *Oysters*, of sixty varieties, leased beds in New South Wales. There is also a collection of other Edible as the Turbo, Haliotis or Mutton Fish, Cardiums, &c., &c. The walls are oil-paintings of the principal food-fishes and numerous photographs of nery and public buildings. Fish Oils are represented by the oils obtained Mullet, and various species of Sharks and Rays, of which stuffed specimens ited. The collections are chiefly of a scientific nature, but the numerous show that large fisheries are capable of being developed in the Australian larly of the Grey Mullets, Herrings, Schnapper, and the Murray Cod and exhibits, consisting of Preserved Fish of several kinds, and Oysters in tins, n the eastern side of the Court.

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s (except those otherwise indicated) in this court are from the AUSTRALIAN Y. A special detailed catalogue is in course of preparation.]

## DIVISION IV.

rman's Boat, full-rigged, with set of fishing lines, hooks, &c. Exhibited by the of Fisheries, New South Wales.

## DIVISION XXVI.

of dried fish of various kinds salted and sun-dried. (2) Smoked Mullet (*Mugil* Smoked mullet, tinned. (4) Garfish. TINNED FISH.—Schnapper—Mullet, or, Travalley, Black-fish, Black Bream, Flounder, Eels, Flathead, Murray other food fish, preserved and tinned. Oysters (*Ostrea glomerata*) tinned. fins. Beche le Mer Prawns (*Penæus esculentus*) tinned; dried Prawns; sh (*Haliotis nævosa*). Exhibited by the Commissioners of Fisheries of New

## DIVISION XXIX.

Sharks and Rays, from the Grey Mullet (*Mugil Grandis*), and from the Sun-fish Glue from the Sun-fish.

## DIVISION XXXII.

rigonias (*T. lammarki*), exhibited by Dr. J. C. Cox, F.L.S., of Sydney.

## DIVISION XLII.

of marine Algæ taken by the trawl during fishing excursions. About twenty- n Port Jackson and the adjacent coast.

## DIVISION XLIII.

n of Sponges, in spirit, in their natural state, containing many new forms. s: 150 specimens: from Port Jackson.

## DIVISION XLIV.

of Polyzoa and Hydroids, dry. (2) A few species of Corals dredged in Port pecies of encrusting coral from the shore.

### Division XLVI.

(1) A very large collection of Oysters from sixty of the principal beds under lease by the Government of New South Wales: all the species known in Australia are exhibited in many varieties. (2) Collection of other edible mollusca. (3) Cuttle fish, squids, octopus, &c. (*Sepia, Loligo, Octopus*).—Exhibited by the Commissioners of Fisheries of New South Wales.

### Division XLVII.

Starfishes: Echinodermata Holothuria: Ascidians; Boltinias, &c.

### Division L.

Collection of edible Crustacea. Exhibited by the Commissioners of Fisheries of New South Wales.

### Division LI.

(1) Collection of food fishes, in spirits; about 300 specimens from Port Jackson and adjacent coast. (2) Collection of food fishes, in spirit, from the rivers and fresh waters of New South Wales. (3) Collection of Sharks and Rays, in particular two rare species about 15 feet long, and a large Sun-fish, *Orthagoriscus* (*mola ?*) 12 feet high, and samples of oil and glue therefrom. Also mullet oil from the Grey Mullet (*Mugil grandis*), Castln. (4) Collection of stuffed food fishes, including all the best kinds for the table.

### Division LII.

Freshwater Tortoises from the rivers and lakes of New South Wales.

### Division LIII.

(1) Collection of Birds injurious to fish, containing specimens of the Pelicans, Shags, Dipper, Terns, Gulls, and other fish-destroying birds. (2) Collection of Ducks. (3) Collection of Cranes and Herons, and some fine specimens of Sea Eagles.

### Division LIV.

(1) Water Rats (*Hydromis:* two specimens) and the Platypus (*Ornithorhynchus anatinus*) with some beautifully prepared skins of the latter. (2) Groups of Eared Seals, adults and young of *Arctocephalus cinereus* from the Seal Rocks near Port Stephens. (3) The Dugong (*Halicore Autralis*), male and female, stuffed specimens. (4) Hide, flesh, and oil from this animal, and the sea-grass on which it feeds (*Zostera sp.*).

### Division LV.

(1) Catalogue of Australian Fishes. By the Hon. Wm. Mackay, M.L.C., &c. (2) "Fish and Fisheries of New South Wales." By the Rev. J. E. Tenison-Woods, F.L.S. —Exhibited by the Commissioners of Fisheries of New South Wales. (3) Collection of Photographs of Australian Fishes—Exhibited by E. P. Ramsay, Esq., F.L.S.

### Division LVI.

(1) Specimens of Ceratodus forsteri (*Krefft.*), stuffed and in spirits; the only living example of the fossil form Ceratodus (*Dipnoi*). (2) Specimens of two species of Cestracion (*Heterodontus*) *H. phillipi* Lacep. and *H. galeatus*, *Gnth.*, a remarkable form allied to, or identical with the fossil genus Cestracion.

### Division LVII.

(1) Photographs of Australian Fish. (2) Photographs of fish market and other public buildings in Sydney. (3) Oil Paintings of Australian fish, life size, by Messrs. Podmore and Carse of Sydney, finished under the direction of the Curator of the Museum.—Exhibited by the Commissioners of Fisheries of New South Wales.

### Division LX.

Reports of Fish Commissions held in New South Wales.——Exhibited by the Commissioners of Fisheries of New South Wales.

*The Leve Antipluvium Waterproof*

BICYCLING AND TRICYCLING

ELEGANT, VERY LIGHT. SUITS. THOROUGHLY WATERPROOF.

ANDERSON, ABBOTT, AND ANDERSON, SOLE MAKERS

# STRAITS SETTLEMENTS.

(*See Plan, p.* 140.)

ınder the above designation lies, roughly speaking, between 1° and 6° N. Lati-
° and 104° E. Longitude. It consists of the islands of Singapore and Penang,
strips of territory on the mainland of the Malay Peninsula called Malacca (one
Settlements), Province Wellesley, and the Dindings. The seat of Government is
ingapore, and the form of administration is that found in Crown Colonies.
ılation of the Straits Settlements, according to the census of 1881, amounted to
was distributed as follows :—

| | Europeans. | Malays. | Chinese. | Natives of India. |
|---|---|---|---|---|
| e ..... | 2,769 | 22,155 | 86,766 | 12,058 |
| ..... | 612 | 21,772 | 45,135 | 15,730 |
| ..... | 40 | 67,513 | 19,741 | 1,891 |
| ellesley ..... | 76 | 58,723 | 21,637 | 10,616 |
| dings ..... | 2 | 1,847 | 466 | 37 |

ns, with rice, the principal article of food among all the native races. This is
.e case as regards the Malays, while the Chinaman, if he can afford it, will
his meal of rice and fish with a small quantity of pork. To supply the various
ut 10,000 persons are wholly employed in fishing operations, and in addition
milies meet their own requirements, which can be readily done, as the waters
ıy literally teem with fish. Large quantities of salted fish are also exported
ing ports.
hibits in this Court show about 150 different kinds of fish ordinarily caught
ts, and include a few specimens of fresh-water fish found in the rivers of the
s. There are also exhibited models of the many implements and appliances
the capture of fish, and several articles actually used in fishing. The
so contains models of fishermen's huts, and of the boats employed in fishing.
o, many samples of the kind of nets used in the various classes of fishing.
pecimens of corals, crustacea and shells have been added.
vernment of the Straits Settlements is much indebted to His Highness the
f Johore, and to the rulers of the Native States of Kedah, Perak, Selangor, and
ıg for the many interesting exhibits which bear their name. They readily
invitation of the Governor (Sir F. A. Weld, K.C.M.G.) to make the collec-
plete as was possible in the limited time at disposal, and in this work the
dents in the Protected Native States of Perak, Selangor and Sungei Ujong
ssisted.

---

**GOVERNMENT OF THE STRAITS SETTLEMENTS.**
ther Nets, Hooks, Lines, Models of Boats, Preserved Fish, &c., &c.
**GOVERNMENT OF JOHORE.** Stake and other Nets, Hooks,
ls of Boats, Fishermen's Dwellings, &c., &c.
**GOVERNMENT OF KEDAH.** Stake and other Nets, Hooks,
ls of Boats, &c., &c.


*NDERSON, ABBOTT, & ANDERSON'S*

MPROVED FISHING BAGS.

STRONG AND WELL MADE.

**, Queen Victoria St., London, E.C.**

**THE GOVERNMENT OF PERAK.** Stake and other Nets, Hoo
Lines, Models of Boats, &c.

**THE GOVERNMENT OF SELANGOR.** Stake and other N
Hooks, Lines, Models of Boats, Specimens of Fish, &c., &c.

**THE GOVERNMENT OF SUNGEI UJONG.** Nets, Hooks, Li
&c., &c., principally for Fresh Water Fishing.

**W. A. PICKERING, ESQ.,** Singapore. Nets, Hooks, Lines, Mod
Boats, Specimens of Fish, &c., &c.

**RAFFLES MUSEUM,** Singapore. Specimens of Fish, Corals, S
&c., &c.

[The stake nets, though differing in detail, are all much the same in principle, a
description of one, of which Model No. 3 may be taken as an example, will serve as a gu
all. The "Kaylong," No. 3, is a fixed engine, usually about 900 feet long, 24 feet wide,
30 feet high, jutting out into the sea at right angles to the shore. It is constructed of
and rattan, in four compartments, the fish entering the first at high or half tide, find their
as the tide falls, into the last, whence they are removed at low water.]

(1) Large Fishing Stake. (2) Fishing Stake. (3) Large Fishing Stake. (4—7) F
Stakes. (8) Fishing Stake used in shallow water. (9—11) Fish Traps. (12) F
Stake used in paddy fields. (13—17) Fishing Stakes. (18—24) Fishing Stakes for
fish. (25) Sieve for small fish. (26) Fish Trap. (27) Fish Shovel. (28) Fish T
(29, 30) Fish Traps. (31) Shovel used for catching shrimps. (32) Basket used
emptying water out of ditches in which fish have been left by previous overflow.
Instrument used in shallow water. The user, walking in the water, plunges the instrum
and out. (34) River Fishing Stake. Used in rivers at foot of hills, where there is a
flow of water. (35, 35*a*—37) Fish Traps. Nos. 35 and 35*a*, generally baited with fre
(37) River Fishing Stake. (38) Small Scoop used in rivers. (39) Scoop used for
fish in rice fields. (40) Instrument used in shallow water. (41) Fish Trap. (42) F
Fishing Stake. The net of this model should be smaller in comparison with the stake
hauled up by a man seated in the shed, when the fish have entered. (43) Trap for
water. (44—50) Fish Traps. No. 46 is placed in still water overnight, baited with wh
(51) Fish Trap used in rice fields, placed in trenches cut to allow of overflow of water
rice fields. (52) Floating Fish Trap used in rivers. (53—56) Fish Traps. (57) F
Trap used in rice fields. (58) Fish Trap. (59) Model of a fishing stake used
rivers; it is 33 feet long, and 16 feet wide at the mouth; the height varies with
depth of water. The upper edge is about one foot above the surface of the river, the
wings extend to the bank on either side, so preventing fish from passing the trap. (60) F
Trap. (61) Basket for emptying water from ditches. (62) Fish Trap. (63) Fishing S
inshore. (64) Fishing Stake. (65) Fish Trap. (66) Freshwater Fish Trap. (67) F
Trap, set overnight in still water. (68) Freshwater Fish Trap. (69) Fish Tra
shallow water. (70) Shrimp Trap, used in rice fields. (71—74) Fish Traps. No. 71 is
with leaves as shown in the model. (75) Basket for shell fish. Used in conjunction w
small boat, the user wading and towing the boat behind him, the shell fish are transferred
the boat as they are collected. (76) Fish Trap. (77) Scooping Basket for shell fish
(78) Sieve for catching shrimps. (79, 80) Baskets for carrying fish. 81—84 Bas
for holding fish. (85) Floating Basket for carrying fish. (86) Basket for holding
(87, 88) Hooks and Lines. (89) Shrimp Hook. (90) Hook and Line. (91, 92) H
and Lines. (93, 94) Hooks for large fish. (95—97) Hooks and Lines. (98) Self-act
Rod and Line. Model of a self-acting rod, made of an elastic bamboo, which is fastened
the ground and bent until the catch on the line meets a corresponding one on a short st
planted at the edge of, or a little distance from, the bank. The bait trails in the water,
the fish on taking it, releases the line from the catch, the bamboo springing back and jerking
the fish on to the bank. (99—104) Hooks and Lines. (105) Fish Hooks. (106) Fi
and Line. (107, 108) Hooks and Lines for sharks. (109, 110) Hooks. (111—11
Hooks and Lines. (116) Fishing Line. (117, 118) Hooks and Lines. (119—123) Fi
and Lines. (124) Fishing Rod and Line for catching prawns. (125) Rod and Line

**ANDERSON, ABBOTT, AND ANDERSON'S**
**CAPE VENTILATING WATERPROOFS**
**ARE UNEQUALLED.**
37, Queen Victoria Street, London, E.C.

ing lobsters. (**126—132**) Fishing Rods and Lines. (**133**) Hook and Line. (**133*a*, *b*, 133*c***) Crocodile Hooks and Lines. (**134—140**) Fishing Rods and Lines. (**141 59**) Fish Spears. No. 142 is used for large fish, the barb on striking being detached the handle, and the fish played with the line attached until exhausted. (**160**) cet in form of a spoon for taking fish out of traps. (**161**) Fisherman's Betel Box. 2) Fisherman's Basket to hold tobacco. (**163**) Fishing Spoon. (**164**) Net. (**165 37**) Casting Nets. (**168**) Net. (**169**) Casting Net. (**170—178**) Nets. No. 172, about 950 feet long and 48 feet wide, is used from a boat and hauled up once y half hour. (**179**) Casting Net. (**180**) Net. (**181**) Casting Net. (**182**) Floating (**183**) Net. (**184**) Seine Net. (**185**) Casting Net. (**186**) Net. (**187**) River (**188**) Net. (**189**) Net. (**190**) Drag Net. (**191**) Floating Net. (**192**) Net. —**199**) Casting Nets. (**200**) Net. (**201—207**) Casting Nets. (**208**) Floating Net. 1) Net. Consists of two parts, which open when dropped to the sea bottom by a long and close on being hauled up. The bait is attached to the middle horizontal cord. A l cord shows the presence of fish. (**210, 211**) Nets. No. 210 is pushed before him by user, wading. The fish are removed, as caught, to the basket attached. (**212**) Hand . (**213—218**) Nets. No. 214, used by three men, one at each end of the net, the third ing the water to frighten the fish towards the net. Length 500 feet. (**219**) Hand Net. 0) Crab Net. (**221, 222**) Shrimp Net. (**223**) Hand Net. (**224**) Net for small fish. 5) Shrimp Net. (**226**) Crab Net. (**227, 228**) Fishermen's Houses. (**229**) Singapore ing Boat. (**230**) Shrimp Boat. (**231, 232**) Boats from Selangor. (**233—235**) Fishing ts. (**236**) Boat from Selangor. Fishing Boats (**237**) from Malacca, (**238**) from Selangor, 9, **240**) from Johore. (**241**) Specimens of fish caught in the Malay Peninsula (**242**) imens of Corals. (**243**) Specimens of Shells. (**244**) *Chlorimenus Commasonii*. (**245**) *is Semisagittatus*. (**246**) *Ikan Hurovan Tusck* (Malay name). (**247**) *Orcella Brevirostris*. 8) Crocodile from Selangor. (**249**) Photograph of fish killed by dynamite explosion in ang Harbour. (**250**) Specimens of dried fish in bottles. (**251**) Singapore Sea Otter.

**LIFE BELTS AND VESTS.**

**No person should venture to Sea without them.**

**ANDERSON, ABBOTT, AND ANDERSON,**

**37, QUEEN VICTORIA STREET, LONDON, E.C.**

# TASMANIA.

(*See Plan, p.* 140.)

TASMANIA exhibits a fine collection of Shells, and specimens in alcohol of the prin Food Fishes. Models of their Fishing Boats, Nets, and Fish-destroying Birds, with Seal other animals peculiar to the country; also photographs and coloured paintings of Fi peculiar to the coast.*

The following particulars relative to the salmon fishing in this colony have been col from the Reports of the Tasmanian Salmon Commissioners for the years 1879 and 1880.

The *Salmonidæ*, both migratory and non-migratory, continue to multiply so rapidly th if their increase be not checked by the occurrence of some such epidemic as that which recently proved so fatal in certain British rivers, the streams in Tasmania must, in the co of a very few years, be thoroughly stocked.

Most of the streams on the north, south, and east coasts are already fairly stocked the *Salmo fario*, and others contain the *Salmo trutta;* but, at present, the Derwent and tributaries are the only rivers in Tasmania in which the true Salmon is believed to be pr The Commissioners will endeavour to remedy this partial distribution of the *Salmo sa* the earliest opportunity.

For the last four years the Commissioners have had collected from the spawning bed the Plenty certain large ova, of a pink colour, much resembling those of the *Salmo s* originally received from England, some of which have been sent to the different Colonies, some have been placed in several of our own rivers. We think it more than probable these Ova will prove to be of the *Salmo salar;* but, if any should prove to be *Salmo trutta* is satisfactory to know that, in general estimation, these rank as little, if at all, inferior to former.

In October, 1879, as has been the case about that period for the last five years, Sm dressed in their beautiful bright migratory scales, came down the water-race which supp the ponds, evidently making their way to the sea. Their numbers, however, on the occasion were far greater than in any previous year,—in fact they came down in millions; the rush continued for at least a fortnight. Many of them, notwithstanding the efforts of Assistant to guide them into the Plenty, found their way into the ponds; but their restlessn and anxiety to get to sea were such that they always immediately escaped when an opp tunity was afforded them. The Trout, on the contrary, which happened to be present, showed any anxiety to leave the ponds.

In October, 1880, as in former years, Smolts again made their appearance in the Ri Plenty on their way to sea; but in consequence of the diversion of the river by flood, numbers which entered the shoots leading to the ponds were less than on former occasio The Commissioners have caused some of these fish to be retained in a special pond, in hope that they will deposit ova, and thus enable their progeny to be placed in other rivers the Colony. Should the experiment prove successful there will be no difficulty in rapid stocking other rivers with migratory salmonoids.

It has been observed when captured migratory species are introduced into our breedi ponds and permanently retained there, that at first, during the migratory season, they ma considerable effort to escape from their confinement. It has also been noticed that althou they continue to present a healthy outward appearance, yet if the forced imprisonment prolonged the generative organs are seriously affected, for they invariably become perfe sterile. These observations may be of much interest to ichthyologists and to others interes in the natural history of introduced fishes.

* Catalogues of the Shells may be obtained in the Court.

captures of Salmon, of from 4 to 7 lbs. in weight, have been made by fishermen nd a fine specimen, upwards of 7 lbs., was taken in Storm Bay, at a locality about ı seaward of the mouth of the parent river, the Derwent. Fish (*Salmonidæ*), as t variety of which various opinions have been entertained, of fully 20 lbs., have with rod and line. In addition to these, a fine specimen of *Salmo fario*, of 28 lbs. ead in the Huon River.

ommissioners still consider it unadvisable to recommend any alteration in the rictions as to netting in the Derwent, not only for the protection of the *Salmonidæ* he interests of the indigenous fish which come into the bays and shallows above n to deposit their ova,—these undisturbed retreats serving afterwards as a protec- young fish until they are able to push out into deep water, and protect themselves tory to remark that since the prohibition of seine fishing the supply of fish for has been both more abundant and more regular than for many years previously,— able argument against throwing open the protected portion of the Derwent.

the year 1880, 23,000 ova were supplied to the other Colonies, and 2350 fry uted in various rivers of this Colony. The Commissioners are always prepared to equirements of any locality upon application being made to them.

enue derived from sale of ova during season 1880, and for fishing licenses during -81 (ended 1st May), was more than sufficient to cover the cost of the establishment iture was £292 9s. 6d.; the revenue by sale of ova, £105; by fishing licenses, £191;

Poachers are still very numerous; but the number of licensed rod fishermen ased from 138 in season 1876–77 to 382 in the season just closed, is a satisfactory ne offenders are not now so numerous as formerly.

---

## COMMISSIONERS OF FISHERIES OF TASMANIA.

[*A Special Catalogue of the Exhibits is in course of Publication.*]

### Division I.

of Seine Net. (2) Model of Crawfish Net. (3) Model of Fishing Boats.

### Division XLVI.

nteresting collection of Tasmanian shells: 368 species prepared for exhibition by C. E. Beddome.

### Division L.

of Edible Marine and Freshwater Crustacea.

### Division LI.

on of food fishes, in spirits and stuffed. (2) Collection of Tasmanian bred *mo salar*) [introduced].

### Division LIII.

of sea-birds—Gulls, Terns, Gannet, Herons, Pelicans, Shags, Grebe and Fish

### Division LIV.

on of Sharks and Rays destructive to fish. (2) Fine specimen of a seal, Sea *enorhynchus leptonyx*).

NDERSON, ABBOTT, AND ANDERSON'S
ISHING TROUSERS
Are unequalled for Quality, Finish and Wear.
7, QUEEN VICTORIA ST., LONDON, E.C.

## Division LVII.

(1) Large collection of photographs and paintings of fish. (2) Views of Tasmanian scenery. (3) Photographs of Tasmanian Food Fishes. (4) Watercolours of Tasmanian Food Fishes. (5) Photographs of Salmon Ponds and River Derwent. (6) Photographs of Tasmanian Scenery. (7) Photographs of the City of Hobart, Tasmania.

## Division LX.

(1) Report of the Royal Commissioners on the Fisheries of Tasmania, 1883. (2) Catalogue of Tasmanian Shells.

[*Other Exhibits not yet arrived.*]

(1) Fishing Hook made and used by the natives (Maories) of New Zealand. (2) Bag or Tobacco-Pouch made from the web of the foot of an albatross, from New Zealand. This bird is sometimes caught by fishing with line and hook. Exhibited by Miss Florence [illegible], 53 Thistle Grove, London, W

FOREIGN

# CONTENTS.


AMERICA, UNITED STATES OF . . . . . .
AUSTRIA-HUNGARY . . . . . .
BELGIUM . . . . . .
CHILI . . . . . .
CHINA . . . . . .
DENMARK . . . . . .
FRANCE . . . . . .
GERMANY . . . . . .
GREECE . . . . . .
HAITI . . . . . .
HAWAII . . . . . .
ITALY . . . . . .
JAPAN . . . . . .
MOROCCO . . . . . .


[redacted]

# AMERICA, UNITED STATES OF.*

(*See Plan p.* 192.)

## The Fisheries of the United States.

1880, according to the returns of the Census Bureau, the number of persons employed the fishery industries of the United States was 131,426, of whom 101,684 were fishermen, the remainder shoresmen. The fishing fleet consisted of 6,605 vessels (with a tonnage 208,297·82) and 44,804 boats, and the total amount of capital invested was $37,955,349, tributed as follows:—vessels, $9,357,282; boats, $2,465,393; minor apparatus and outfits, 145,261; other capital, including shore property, $17,987,413.

The value of the fisheries of the sea, the great rivers and the great lakes, was placed at 3,046,053, and that of those in minor inland waters, at $1,500,000—in all $44,546,053. ese values were estimated upon the basis of the prices of the products received by the ducers, and if average wholesale prices had been considered the value would have been ch greater. In 1882 the yield of the fisheries was much greater than in 1880, and prices h "at first hand" and at wholesale were higher, so that a fair estimate at wholesale market es would place their value at the present time rather above than below the sum of 00,000,000.

Since 1865 the fisheries have increased in extent and value to a degree without parallel in eir previous history. Before the war of the rebellion (1861–1865) many of the fisheries ich are now most important had no existence, and for four or five decades preceding only e oyster fishery, whale fishery, cod fisheries, mackerel fishery, and shad and alewife fisheries re of any considerable importance. The recent increase is chiefly due (1) to the introction of the improved methods of refrigeration, by means of which sea-fish are distributed idely throughout the interior of the country; (2) to greatly extended facilities for steam ansportation; (3) to the extended introduction of methods of packing in hermetically-sealed ns, and of more attractive methods of preparing for market the several kinds of dried d smoked fish; (4) to the introduction of improved vessels and apparatus by means of ich the expense of capture has been greatly diminished; and (5) to the efforts of a conderable number of enthusiasts, anglers, statesmen, and philanthropists, who, by the organiion of Fishery Societies, State Fish Commissions, and the United States Fish Commission, d by their publications, have awakened public interest, secured extensive appropriations of blic money for the propagation and acclimatisation of useful fishes, and have demonstrated e value to the country of many previously neglected fishery resources.

The fisheries of the New England States are the most important. They engage 37,043 en, 2,066 vessels, 14,787 boats, and yield products to the value of $14,270,393. In this strict the principal fishing ports in order of importance are: Gloucester, Portland, Boston, ovincetown, and New Bedford, the latter being the centre of the whale fishery. New ngland was settled in 1620 by colonists, chiefly from the western counties of England, ho selected that portion of the coast on account of its peculiar fitness for the prosecution of e fisheries, and by the middle of the seventeenth century there was a considerable fleet of tches and snows engaged in the cod fishery on the off-shore banks, where, especially on the nks of Newfoundland, France, Spain, Portugal, and England, already had a fleet of several undred large vessels. Just before the war of the revolution New England had 665 vessels ,405 men employed in its fisheries.

Next to New England in importance are the South Atlantic States, employing 52,418 men, vessels (the majority of which are small, and engaged in the shore and bay fisheries), 1 boats, and returning products to the value of $9,602,737.

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A number of special catalogues are being printed to accompany this collection. These may be obtained at fice of the American Commissioner.

Next are the Middle States, employing in the coast fisheries 14,981 men, 1,210 vessels, 8,293 boats, with products to the amount of $8,676,579.

Next are the Pacific States and Territories with 16,803 men, 56 vessels, 5,547 boats, and products to the amount of $7,484,750. The fisheries of the Great Lakes employ 5,050 men, 62 vessels, and 1,594 boats, with products to the amount of $1,784,050. The Gulf States employ 5,131 men, 197 vessels, and 1,252 boats, yielding products to the value of $545,584.

Forty-three distinct fisheries are recognised by American writers, each being carried on in a special locality, and with methods peculiar to itself. Among the most important of these are the oyster fishery, the off-shore cod fishery, the whale fishery, the fur-seal fishery, the mackerel fishery, the menhaden fishery, the halibut fishery, the Antarctic seal and sea-elephant fishery, the west-coast salmon fishery, the lobster, the shad and alewife fishery, the swordfish fishery, and the clam fisheries.

The off-shore fisheries are carried on chiefly by citizens of the New England and Middle States, and are prosecuted on the great oceanic banks extending from Nantucket to Labrador, and upon the ledges and shoals between these and the coast.

The great Purse-seine fisheries for mackerel and menhaden are carried on north of Cape Hatteras at distances from the shore varying from one mile to one hundred and fifty miles. The fishing grounds in the Gulf of St. Lawrence, formerly frequented by many hundreds of American vessels, have been entirely abandoned since the introduction of the Purse-seine, and in 1882 only one vessel visited those waters, returning with about 200 barrels of mackerel. The oyster fishery is located for the most part between Cape Hatteras and Cape Cod, chiefly in the great inland bays. In all the great rivers of the Atlantic coast are fisheries for the anadromous shad and the two species of alewife. About the Keys of southern Florida is an extensive sponge fishery, and on the shoals of the Gulf of Mexico the red snapper and grouper fisheries are yearly increasing in value. The fur-seal fishery is chiefly located upon the Pribylov Islands of Alaska. A small fleet of vessels yearly penetrates to the icy-bound islands of the Antarctic for seal-skins and sea-elephant oil. The whaling fleet, with headquarters at New Bedford and San Francisco, in the main frequent the North Pacific, though a number of smaller vessels, many of them from Provincetown, pursue the sperm whale in tropical waters. The salmon fishery is seated chiefly upon the Columbia River and its tributaries, though other rivers in Oregon and California produce large quantities of salmon, which is extensively "canned" and exported. The most valuable product of the Great-lakes fisheries is the whitefish. The swordfish fishery of Southern New England, though employing but 40 vessels, and perhaps 160 men, produces 1,500,000 pounds' weight annually.

The export of American fishery products is comparatively small owing to the fact that the demand for such products for home consumption is really greater than the supply, and is constantly on the increase. In 1880 the total value of exported fish products amounted to $5,744,580; of which, according to custom-house records, England received $2,601,017. Of the quantity sent to England $1,596,007 was in canned preparations, and $363,790 in fresh oysters, the remainder being chiefly products of the whale fishery. In former years there was an extensive export trade in dried cod with Spain and Portugal, but this is now entirely abandoned. Large quantities of canned salmon are sent to China, Japan, and Australia.

At present no subsidies are allowed to fishermen, except that the duties on imported salt, used in the preparation of fish, are remitted; this practice was begun in 1863, at which time the old bounty law was repealed.

The United States, with the intention of aiding its fishermen, has paid to Great Britain the sum of $5,500,000 for the privilege of fishing in the British Provincial Waters from 1873 to 1885.

Since 1871 the United States has appropriated over one million dollars to be used by the United States Fish Commission in behalf of the fishermen and fish consumers, and under the direction of the Commissioner, Prof. Spencer F. Baird, very important results have been accomplished. All the state governments with the exception of six have established state fish commissions, and most of them have been liberally supported by grants of money.

The undeveloped fishery resources are very great. Many of the fishes and invertebrates which in Europe are highly valued by the poorer classes are never used here. Only about

ıe 1500 species of fishes known to inhabit the waters of the United States are ɾ found in the markets.

ɛlaborate report upon the fishes and fisheries of the country in 1880 is now being l by the Government—the joint production of the Fish Commission and the Tenth

G. Brown Goode,
*Assistant Director of the U. S. National Museum, Washington, and Commissioner to the Exhibition.*

ɛ.—The participation of the United States in the Exhibition is in accordance Act of Congress approved July 18, 1882, by the terms of which the United States oner of Fisheries was instructed to prepare, under the auspices of the Department of ɔmplete and systematic representative exhibition of the fisheries of the United States.]

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## COLLECTIVE EXHIBIT OF THE UNITED STATES.*
## ANALYSIS.

A.—Aquatic Animals and Plants beneficial or injurious to Man.
B.—Fishing Grounds and Geographical Distribution.
C.—Apparatus of Sea and Freshwater Fishing.
D.—Fishing Vessels and Boats and their Fittings.
E.—Fishermen and Anglers: Dress, Economic condition, &c.
F.—Apparatus connected with the Whaling and Sealing industry.
G.—Fishery Products and the apparatus and methods of their Preparation.
H.—Fish Culture: apparatus and methods.
I.—Investigation of the Waters: Deep Sea Research, &c.
K.—Literature of Fish, Fishing, and Fisheries.

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## :ON A.—AQUATIC ANIMALS AND PLANTS OF NORTH AMERICA BENEFICIAL OR INJURIOUS TO MAN.

### I.—Mammals.

roup of Fur Seals, *Callorhinus ursinus*, with screen of water-colour by Henry W. Elliott, illustrating the seal life of the Pribylov Islands; stuffed ɔal, *Histriophoca equestris*; cast of Harbor Seal: stuffed head of walrus. *Odobænus*

ıst of Manatee, skull of *Rhytina gigas*, from Bering Island.
ıst of White Whale, *Delphinapterus*; fœtal Blackfish, *Globicephalus*; ıasts of severaal smaller-toothed cetaceans, with skulls of the same; ıads of cetaceans.

### II.—Birds.

ɔllection of skins of Aquatic Birds of the United States. Exhibited ıited States National Museum.
roups of Aquatic Birds.

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ections here enumerated are for the most part the property of the U. S. National Museum and the U. S ssion.

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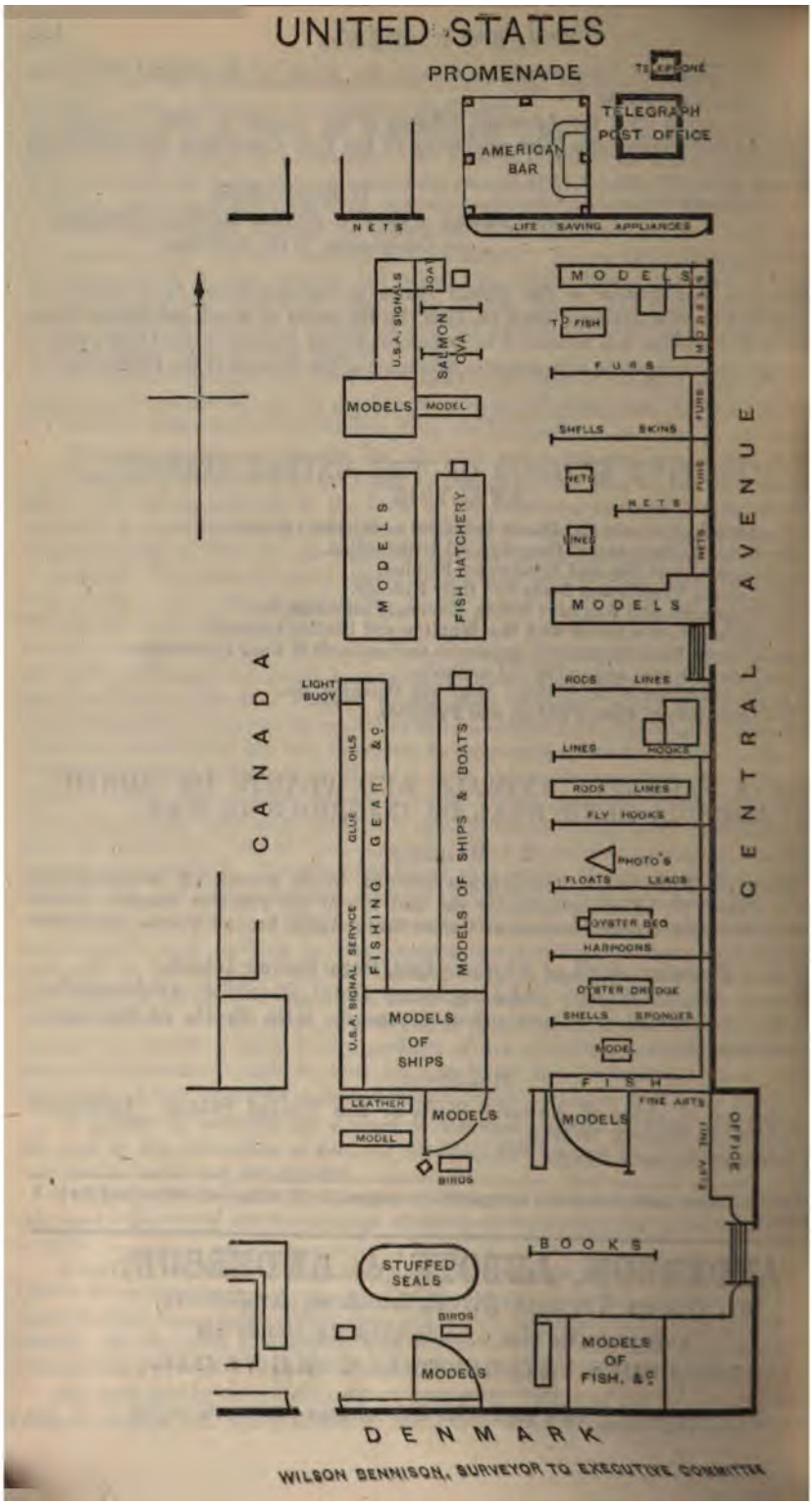


WILSON BENNISON, SURVEYOR TO EXECUTIVE COMMITTEE

### III. IV.—Reptiles and Batrachians.

7. Cast of Alligator, *Alligator mississippiensis.*
8. Casts of Tortoises, *Gopher*, *Xerobates polyphemus*, Terrapin, *Malacoclemmys* *tris*, Slider, *Pseudemys rugosa*, Southern Terrapin, *Macrochelys lacertina*, Soft-shell le, *Aspidonectes ferox*, Green Turtle. *Chelonia mydas*, Loggerhead Turtle, *Thalassochelys* *ana*, Leatherback Turtle, *Dermatochelys coriaceus.*
9. Casts of Water Snakes, *Tropidonotus*, several species, Moccasin, *Ancis-* *n piscivorus*, Rattlesnake, *Crotalus adamanteus*, &c.
0. Collection of 24 species of tailed batrachians, including *Siren*, *Necturus*, *Siuma*, *Menopoma*, *Amblystoma*, *Siredon*, &c.
1. Four species of edible frogs, including Giant Bullfrog, *Rana Catesbiana.*
2. (Cancelled).

### V.—Fishes.

3. Casts of 121 characteristic fishes, including most of the important mic species, arranged on nine screens.
4. Casts of Giant Catfish, *Amiurus ponderosus*, Guasa, *Serranus guasa*, &c.
5. A series of photographs of the important fishes of the United States.
6. A series of proofs of engravings of the food fishes of the United States, red to accompany the forthcoming quarto report, with specimens of the original drawings.
7. Colour sketches of fishes; chromolithographs of twenty water-colour hes of game fishes exhibited by Charles Scribner's Sons (publishers of Kilbourne & e's Game Fishes of the United States).
8. Series of fishes in alcohol: Fishes of Alaska. The American Salmonidæ. es of the Gulf of Mexico and East Florida. The genera of fresh-water species. Fishes Adirondacks, collected by Fred. Mather.
9. Living fish eggs, fishes, &c. All under fish culture; section **F**.
0. Collection of market fishes in fresh condition on ice sent from time to by E. G. Blackford, New York.

### VI.—Mollusks.

1. Models of Giant Squid, *Architeuthis princeps* and of Giant *Octopus*, red under direction of J. H. Emerton.
2. Series of Gasteropoda, useful as affording food, bait, &c., or injurious by oying edible mollusks.
3. Series of specimens showing the life of the American Oyster from the of attachment to full growth, under various conditions influencing development.
4. Collection of plates and diagrams illustrating the embryology of the rican Oyster.
5. Series of American Oysters, illustrating geographical distribution and variation.
6. Other useful Mollusks, *Unio*, *Haliotis*, &c.
7. Specimen illustrating injurious work of Teredo and other pernicious usks.
8. Enemies of the Oyster.

### II.—Marine and Fresh-Water Invertebrates, exclusive of Mollusca.

0. Collection of economic Crustaceans, mainly alcoholic, containing forty- species, used as food and bait, and injurious to submarine structures of wood. It includes obster, *Homarus americanus*, Rock-lobster, or Salt-water Crayfish, *Panulirus interruptus*, Crayfish, *Cambarus* and *Astacus*, common edible Crab, *Callinectes hastatus*, Rock Crabs,

**WATERPROOFS FOR BOYS,**
In Tweed, Paramatta, and other Materials.
WATERPROOF LEGGINGS & SCHOOL SATCHELS.
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*Cancer irroratus* and *Borealis*, California Market Crab, *Cancer magistra*, Stone Crab, *Menip mercenaria*, common Shrimp, *Crangon vulgaris*, Southern Shrimp, *Penæus setiferus*, Califor Shrimp, *Crangon franciscorum*, King Crab, *Limulus polyphemus*, &c.

30. Collection of economic worms in alcohol, including the marine annel most commonly used as bait, and the American medicinal leech, *Macrobdella decora*, Verrill.

31. Collection of economic echinoderms, mostly in alcohol, containing s species, used as food, or available as such, injurious to oyster beds, &c., as follow cucumber, *Pentacta frondosa*, Sea Urchins, *Strongylocentrotus dröbachiensis*, *S. francisc Echinarachnius parma*, Starfishes, *Asterias vulgaris*, a. Forbesii.

32. Collection of Florida commercial sponges, containing six species two hundred and thirty-seven specimens, furnished by McKesson and Robbins, of New Y These species are as follows: Glove Sponge, *Spongia graminea*, Sheepswood Spon *gossipina*, Velvet Sponge, *S. meandriniformis*, Grass Sponge, *S. cerebriformis*, Yellow Sp *S. corlosia*, and *dura*. From the same source, four specimens of Sheepswood Sponge, trating artificial propagation by means of cuttings; also, one specimen of the boring sp *Cliona sulphurea*.

33. Complete collection of the described species of fresh-water Cray-fi *Cambarus* and *Astacus*, occurring within the limits of the United States. Contains forty species.

### VIII.—Algæ.

34. Collection of marine Algæ of the United States, prepared by W. Farlow.

35. Plates of Wood's "Fresh-water Algæ of the United States," as publi by the Smithsonian Institution.

## Section B.—FISHING GROUNDS.

### IX.—Models and Maps of Fishing Grounds.

36. Cardboard model in relief of the off-shore banks of North America, fr the Grand Bank to New Jersey, showing contours to a depth of 2,800 fathoms.

37. Relief model of the Gulf of Maine, prepared by C. Lindenkohl.

38. Relief models of the Eastern Continental Slope, prepared by the Uni States Coast and Geodetic Survey.

39. Model of a Chesapeake Oyster-bed, showing effects of dredging u undredged portions, prepared by Lieut. Francis Winslow, U.S.N.

40. Chart showing the location and extent of the present and abandon whaling grounds of the world, prepared by A. Howard Clark.

41. Series of charts showing the location of the Oyster-beds and the pre condition and progress of Oyster culture, prepared by Lieut. Francis Winslow, U.S.N.

42. Charts showing the distribution of food fishes and the location of principal fishing-grounds.

43. General coast charts, exhibited by the United States Coast Surv United States Navy Hydrographic Office, and S. Thaxter and Sons.

### X.—Maps showing Geographical Distribution.

44. Charts showing distribution of the pinnipeds of the world, prepared J. A. Allen.

45. Chart showing geographical distribution of the seals and fur-bear animals of Alaska, prepared by W. H. Dall.

46. Series of eight charts, showing distribution of food and game fishes North America, prepared by G. Brown Goode.

ANDERSON, ABBOTT, & ANDERSON'S
FISHING STOCKINGS
ARE GUARANTEED ABSOLUTELY WATERPROOF.
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## SECTION C.—APPARATUS OF SEA AND FRESH-WATER FISHING.

### XI.—Clubs, Spears, Darts, Rakes, and Dredges.

7. Bows and arrows, darts, throwing sticks, spears, harpoons, clubs, spear &c., made and used by the Indians and Eskimos of Alaska, the North-west coast, and parts of the United States.

8. Eel spears, porpoise and dolphin grains, swordfish lily-irons and lances harpoons used along the Atlantic seaboard for the capture of numerous species; halibut and gob-stick for killing the fish and disgorging the hook; squid jigs used by Grand Cod fishermen in the capture of squid for bait: mackerel gaff or gambeering iron and mackerel bob formerly used by New England fishermen for the capture of mackerel without use of bait.

9. Oulachan rake, used by the Indians of the North-west coast; clam-rakes, and claws, sponge-hook, moss-rakes, oyster-tongs, rakes, and scrapers.

### —Fish-Hooks, Jigs and Drails, Artificial Baits, Flies and Fly-Hooks, Gulleters, Clearing Rings, &c.

1. Series of Indian and Eskimo hooks made of bone, wood, and iron.

2. Series of steel hooks, showing the manufacture of hooks from the plain to the finished hook, and all the principal varieties of fish-hooks used in sea and fresh-water fishing, including the Barbless, Limerick, Central-Draught, Kirby, Aberdeen, Kinsey, Sole, shark and dog-fish hooks.

3. Jigs and drails for the capture of cod, weakfish, Spanish mackerel, bass, fish, and dolphin; mackerel jigs formerly extensively used, with lead, ladles, molds, file, &c., used in their manufacture.

4. Spoon-baits, trolling-spoons, spinners, minnows, and insects for salmon, bass, pike, and pickerel fishing.

5. Case of lure-baits and ornamented hooks from Alaska.

6. Collection of over seven hundred varieties of salmon, bass, and trout arranged on cards and labelled with their trade names.

7. Case of insects used for bait and injurious or useful to the fisheries, by Prof. C. V. Riley.

8. Spring hooks for pickerel, "snap and catch'em hooks," Edgar barbless eagle-claw trap.

9. Bait-boxes, creels, gulleters, clearing rings, pocket scales, and other miscellaneous articles used by anglers.

### XIII.—Fishing Lines and Rigged Gear.

1. Indian and Eskimo lines made of kelp, whale and seal hide and cedar

2. Cotton lines, shroud-laid and cable-laid, white and tarred; linen, flax, and silk lines, including waterproof fly-lines, and other silk lines for salmon and trout

3. Spanish gut as imported for the manufacture of leaders; single, double, twisted gut leaders, minnow gangs, brails, gangings, used in various sea fisheries.

4. Stone, lead, brass, and composition sinkers for nets, seines, and hand

5. Indian and Eskimo floats carved in wood; glass, cork, and wood floats nets and lines in sea fisheries; wood, cork and quill floats for pond fishing.

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GEWAST TAFFEN KLEEDINGSTUKKEN VOOR LAND- EN ZEE-GEBRUIK;
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GETUIGSCHRIFT.
Den Heeren ANDERSON & Co. Ministerie van Binnenlandsche Zaken, 3 September 1872.
Voor omstreeks zeven jaren hebt gij voor mij een Gewast Taffen Overjas gemaakt, die, zonder slect of breuk, tot op dit jaar heeft dienst gedaan. (Geteekend) A. F. O. Liddell.

**64.** Hand-lines rigged for cod fishing on the off-shore and in-shore banks and ledges; pollock hand-lines; bluefish trolling-lines; lines for pond fishing; gear for the capture of catfish, weakfish and other species; Indian trawl lines made of cedar; cod, haddock, and halibut trawls in sections and fully rigged with buoys and anchors; snares and eel bobs; Indian fishing lines from Alaska and the North-west coast.

### XIV.—Fishing Rods, and Reels for Lines and Nets.

**65.** Plain and split bamboo rods, for salmon, trout, bass, and general fishing; ash and hornbeam, and ash and lancewood rods; combination trolling pole, harpoon line holder and cane; and other kinds of rods.

**66.** Simple reels for fly-fishing, with and without check, made of brass, German silver, rubber, ebonite, and celluloid. Multiplying reels for bass-fishing, with and without check; automatic reels, Kentucky reel, quadruple, multiplying, nickle-plated reels. Spools, winders, trawl-line rollers, line chocks for whale boats, trawl-winch or hurdy-gurdy, &c.

### XV.—Nets and Seines and Materials used in their Manufacture.

**67.** Twine used in making nets and seines, exhibited by American Net and Twine Company. Samples of netting, white, tanned, and tarred, showing varieties of mesh and kinds of twine.

**68.** Gill nets, full-sized and in models, for the capture of shad, cod, mackerel, herring, white-fish, minnows, and other species. Gill nets made by the Indians from animal fibre, "babiche," &c.

**69.** Trammel nets used for general fishing in rivers and ponds of Northern Mississippi Valley. Herring and cod seines. Baird collecting seine and "Baird net." Seines and nets made of grass, pineapple fibres, and other materials.

**70.** Handle or dip nets and landing nets used in the capture or in handling of mackerel, menhaden, trout, and other fish. Net used in the capture of the oulachan and surf smelt by the Indians of the North-west coast. Dip nets or baskets used by the Indians.

**71.** Oyster dredge and hoisting apparatus, dredge nets, dredges for clams and other shell-fish. Full-sized oyster dredge used by dredging steamers.

**72.** Folding or jerk nets, including full size and model mackerel purse seines and model mackerel-seine pocket, mullet and shrimp cast-nets, &c. Model of mackerel purse-seine mounted on iron pipe to show the manner of pursing, &c.

### XVI.—Fish Traps, Weirs, and Pounds.

**73.** Models and drawings of fish slides used for catching shad in the rivers of North Carolina.

**74.** Models of bar weirs and brush weirs used for catching herring in the Bay of Fundy; salmon weirs, heart-nets, pound nets, floating traps, basket weirs from Alaska, &c. Model of fish weir used by aborigines of Virginia in the fifteenth century.

**75.** Wicker fish-pots used by Indians of California, and by fishermen of Florida. Lobster pots in full size, and models showing the various styles used on the coast of New England.

**76.** Eel pots, with and without leaders, full size, and model fyke nets, lobster trap, &c.

### XVII.—Fishing Stations.

**77.** Model of shad battery at Havre de Grace, Maryland, and model of "pond fishery" for white-fish at Grassy Bay, Detroit River, Michigan.

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**SAILOR'S AND FISHERMEN'S OILSKINS.**
Celebrated in Canada, Australia, New Zealand, Cape of Good Hope, Natal, India, and China, as the only reliable makers of **OILSKINS** that can be packed for shipment, guaranteed to arrive in a marketable condition at their destination.
**37, Queen Victoria Street, London, E.C.**

XVIII.—Knives, Gaffs, and other Apparatus.

78. Indian and Eskimo knives made of stone, bone, and iron for cutting fish blubber.

79. Cod splitting, ripping, and throating knives; finning and flitching ves; bait chopping knives; mackerel splitting and reaming or creasing knives; scaling ves, slivering knives, &c.

80. Salmon, cod, haddock, halibut, and mackerel gaffs; halibut cutters; k used in decapitating the fish; fish forks and pews used in storing and handling the catch.

81. Bait mill for grinding fish for mackerel bait; clam-choppers, &c.

XIX.—Illustrations of the Fisheries.

82. Series of sketches in crayon illustrating the various sea fisheries.

83. Series of photographs large and small illustrating the methods em-ed in the hand-line and trawl-line, cod and halibut fisheries, the lobster and other fisheries.

Section D.—FISHING VESSELS, BOATS, AND FITTINGS.

XX.—Vessels and Boats.

84. Series of rigged models of all types of vessels used in the fisheries past present.

85. Series of builders' models showing evolution of the New England fish-schooner.

86. Series of models of all important types of boats used in the fisheries; full-size whale boat, dories, shadow canoe, portable and folding boats, Eskimo bidarka and ura, Indian birch canoe, &c.

87. Series of large photographs, 30 by 40 inches, showing fishing boats and ls in different situations.

88. Series of large photographs of ship yards and boat shops illustrating the ruction of fishing craft.

XXI.—Boat Fittings and Appliances.

9. Canvas used on fishing vessels, exhibited by Russell Mills Company, olony Mills, and others.

0. Cordage used by fishing vessels, exhibited by Sewall, Day & Co., and s.

1. Model of steam windlass, exhibited by American Ship Windlass Com-models of capstans exhibited by Frederick S. Allen.

2. Collection of nautical instruments and books, such as are used on the England fishing vessels.

3. Series of cabin lamps, lanterns, torches, &c., used on vessels and boats a angling.

4. Fog horns of various types, including Collins' patent fog alarm.

5. Copper paint for vessels; Nelson's canvas-preserving solution.

6. Large number of special appliances for rigging vessels and boats, ited by Wilcox, Crittenden & Co., and others; chafing gear, hanks, grommets, clews, bles, row-locks, rudder fixtures, &c.

7. Collins' adjustable marine drag, and Collins' improved adjustable e drag.

8. Collection of oars and paddles, exhibited by E. W. Page and others.

9. Charts of United States Coast Survey, United States Hydrographic e, S. Thaxter & Son, and others.

**ANDERSON, ABBOTT, AND ANDERSON'S**

LEATHER LINED **FISHING BOOTS** REQUIRE NO DRESSING.

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## Section E.—FISHERMEN AND ANGLERS.

### XXII.—Fishermen and their Apparel.

**100.** Lay figures of fishermen of different classes, showing costumes, plements, &c.

**101.** Photographs, 30 by 40 inches, showing groups of fishermen of ferent nationalities, or as engaged in the several branches of the fisheries.

**102.** A collection of fishermen's wearing apparel, in woollen, oiled co and rubber; boots, mittens, &c.

**103.** A collection of anglers' wearing apparel.

### XXIII.—Food, Medicine, Shelter.

**104.** Canned, steam-dried, and other foods used by fishermen and angler

**105.** Fisherman's medicine chest, such as is carried by the Gloucs schooners.

**106.** Series of photographs of fishermen's houses, boarding-houses, beth &c.

**107.** Tent and portable house for anglers, with complete camping outfit.

### XXIV.—Vessels' Papers.

**108.** Vessels' papers, insurance policies, log-books of fishing voya papers of Gloucester Seamen's and Fishermen's Widows' and Orphans' Aid Society.

### XXV.—Habits of Fishermen.

**109.** Collection illustrating the games, amusements, literature, art-work the fishermen; musical instruments, carvings ("scrimshandy"), &c.

### XXVI.—Fishermen's Tools and Outfits.

**110.** Fishermen's tools, "ditty-boxes," palms, sail-needles, knives, netti needles and mesh-boards, coopering tools, &c.

## Section F.—APPARATUS CONNECTED WITH THE WHALING AND SEALING INDUSTRY.*

### XXVII.—Whaling Vessels and Boats.

**111.** Model of a four-boat whale ship, with a decapitated sperm whale alongside, illustrating the manner in which the blubber is cut off, hoisted in, and lowered the blubber-room; also showing the amount of canvas carried by a vessel while engaged this work, and the duties of the officers and foremast hands, as well as the positions of works and whale boats.

**112.** Model of "camels," built in 1842, for floating whaling vessels on Nantucket Bar, with the hull of a vessel showing the relative positions of the one to the when in operation.

**113.** Model of try-works transported by whaling vessels, for extracting the oil from the blubber, with the receptacles for scrap and for cooling the oil; also miniature models of some of the implements commonly known as "try-works gear" for manipulating the oil and scrap.

* Here are included, for convenience of arrangement, the apparatus of manufacture or preparation of whale products, the preliminary stages of which being usually conducted on board of the whaling vessels may be regarded as a portion of the fishery proper.

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14. A full-sized whale boat, 28 feet long, with all the apparatus of ture; the names of the various parts of the boat, the boat fittings, and each article used in chase and capture of the whale are plainly labelled. Every article in the boat, as well as boat itself, have been in actual use.

### XXVIII.—Whaling Craft, Harpoons, Guns, and Lances.

115. A series of 47 hand-harpoons, arranged in groups, but not in chronoical order, including the forms employed by the early and modern whalemen, and several s of the walrus-harpoon.

116. A series of guns, including eight shoulder guns of different patterns, h breech-loading and muzzle-loading; several types of the darting gun; swivel gun; and ket gun; also accessories, including cartridges, wads, &c.

117. A series of 33 gun harpoons of various forms. Though these irons e no commercial value at present, with the exception perhaps of those intended for the vel-gun, yet they have been used, and are interesting and valuable as a whole, constituting they do the numerous links in the chain that connects the past with the present.

118. Earliest types of the hand-lances, formerly exclusively used for killing ales, the past and present forms of the lances for killing Seal, Sea-elephant, and Walrus, the -fashioned, non-explosive gun-lance, and the bomb-lance, darting-bomb, and rocket-bomb of present. Also an example of the first bomb-lance, patented in the United States for killing ales. Two forms of the explosive harpoons, which may be thrust by hand, and one form nded to be used in connection with an improved pivot gun. An explosive hand-lance, eral bomb-lances that have been cut from dead whales, some of which failed to explode, ers being exploded and represented by fragmentary pieces.

### XXIX.—Cutting Gear.

119. A series of whalers' implements known comprehensively as cutting-gear try-works gear, arranged on and about a pyramidal wooded frame-work, from the centre of ch the blubber-tackle is suspended. A cutting stage is rigged at the right; upon it is ed a lay figure, life-size, representing an officer in the act of cutting the blubber from the le. Two long slabs of baleen cross each other near the top in the central front, and boat s are placed at the right and left corners. Various long-handled implements, including the ng spades, head-spades, skimmers, and bailers, are arranged in frames at the rear. The y chains and toggles used for fastening the whale to the vessel, and for hoisting in the ber, are placed above the front base. The superstructure consists of a main royal pole, ut bows, an American ensign, and a life cast of a petty officer standing upon the cross-, with a marine glass at his eye, on the lookout for whales.

### XXX.—Aboriginal Whaling and Sealing Apparatus.

20. A series of whaling implements used by the Makah Indians of Cape ery, Washington Territory, including the harpoon-staff, harpoon, and lanyards, the lance- and lances, the sealskin buoys, and tow-ropes made of the fibres of spruce roots.

21. Harpoons and lances employed in whaling and sealing by the Eskimos laska, and the Hudson Bay region.

## ECTION G.—FISHERY PRODUCTS AND THEIR PREPARATION.

### XXXI.—Apparatus and Materials used in the Preparation and Care of Products.

22. Fish cars and other floating cages for aquatic animals, including el of fish-marketman's car for the preservation of living fish; model of fish-car towed by smack for keeping the catch alive; live-car, full size, for keeping fish alive; model of ter-car for keeping live lobsters.

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**123.** Ice-crusher, ice-picks, and tools used in handling ice in pack fresh fish for market, or storing them in the vessel's hold; model of refrigerator for preser fish.

**124.** Model of fish wharf, with all the appliances for handling and cu dry fish, including scales for weighing, butts for pickling, flakes for drying, &c.; mod tilting and brush flakes; model of smoke-house for curing herring; models of sardine fa at Camden, Me, showing the interior arrangements of tables, elevators, &c.; model of lob boiling house at Boston, showing the vats for steaming the lobsters, the wharf, and derricks used in handling the lobsters. It is accompanied by models of lobster smack the principal forms of lobster nets. Model of Menhaden oil and guano factory, showing apparatus by means of which the oil and guano are prepared. Model of fishery at W Illinois, showing the apparatus employed in cleaning and salting down lake white-fish.

**125.** Apparatus used in the preparation of boneless fish, including m boxes, knives, cutting tables, box-nailing machine, nape-hooks, &c. Brand used by inspe for marking barrels of pickled fish; oil bags, dippers, and other inplements used manufacture of cod liver oil; model of guano mixer, employed in the fish-guano works f purpose of thoroughly mixing the fish-scrap with the mineral phosphate and sulphuric a

**126.** Collection of cans, boxes, bags, and barrels for packing and tr porting fish and oysters; box ends, sides, and covers, printed with the brands of boneless

**127.** Samples of varieties of salt used in curing fish; exhibit showing manufacture of cotton-seed oil, used to a considerable extent instead of olive o sardines, &c.

**128.** Several series of 30 by 40 inch photographs, showing the manne handling and curing fish, landing from the vessels, drying, pickling, smoking, &c showing the interior arrangements of canning factories, boneless fish factories, &c.

**129.** Models of apparatus used in steaming oysters.

## XXXII.—Products of the Fisheries Prepared for Food.

**130.** Dry salted or plain dried preparations, including whole and bon codfish and other species. Whale sinew used for food by the Chinese of California; meats of Abalone: Indian food, including dried Smelts, Salmon, Prawn, Shrimps, Cuttle Clams, &c.; Irish moss, &c.

**131.** Smoked preparations, including Halibut, Herring, Mackerel, B Fish, White-Fish, Salmon, Sturgeon, and Haddock; also varieties of fish prepared b Indians and Eskimo.

**132.** Pickle or brine salted preparations, including Mackerel, Her Caviare, &c.

**133.** Preparations in spices, vinegar, &c., including Sardines, in mus and tomatoes, Eels in jelly, Mackerel and Ocean Trout in mustard and tomato sauce, &c

**134.** Preparations in oil, including American Sardines, &c.

**135.** Cooked preparations in cans, including fresh Codfish, Mackerel, H ring, Bluefish, Sea Bass, Ocean Trout, Salmon, fish and clam chowders, Lobsters, C Oysters, Shrimps, &c.

**136.** Samples of crude, half bleached and bleached Irish moss *Chon crispus*, used by cooks, confectioners, &c.

## XXXIII.—Products of the Fisheries used for Clothing.

**137.** Mammal furs, including skins, of fur-seal, sea-otter, &c., used muffs, gloves, collars, cuffs, and trimmings.

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XXIV.—MATERIALS EMPLOYED IN THE ARTS AND MANUFACTURES.

Ivory of mammals, including tusks of Walrus used for trinkets, handles, uttons, paper-knives, counters, &c.; ivory of Narwhal, *Monodon monoceros*, used for eth of Sperm Whale, *Physeter macrocephalus*, and their application to the manufacture uttons, and trinkets.

Ivory of reptiles; teeth of Alligator, used for jewelry, whistles, cane-uttons, &c. An extensive trade in Alligator teeth is carried on in Eastern Florida, tablishments being engaged in their manufacture into fancy articles.

Bone of Mammals, including Sperm Whale, jaw-bone made into ngs, martingales, sail thimbles, pulley-blocks, seine-needles, chopping-knife, &c.; bilis" of Walrus, used for charms, &c.; bone of fishes, including sword of Swordfish, *ladius*.

Baleen, or whalebone, crude and prepared, for various uses. This includes slabs of whalebone of Bowhead Whale, *Balæna mysticetus*, North-west coast nale, *Balæna Sieboldii*, Humpback Whale, *Megaptera versabilis*, Sulphurbottom Whale, *s sulfureus*, California Gray Whale, *Rhachianectes glaucus*, and other species; strips repared by the Eskimo; also whalebone in condition to be used in the manufacture brushes, hats, caps, canes, corsets, and numerous other articles.

Tortoise-shell, *Eretmochelys squamata*, and commercial tortoise-shell nanufacture of combs, knife handles, and other articles.

Scales of fishes used in ornamental work, with specimens of flowers articles manufactured.

Pearls and nacre, embracing the pearl-yielding shells, with the pearls nother-o'-pearl in the rough state, with the manufactured buttons, handles, and earl-powder, inlaid work, and paper-maché, ornamented with mother-o'-pearl; ear-*liotidæ* used in manufacture of buttons, handles, inlaid work, and pearl powder; ters, *Aviculidæ*, with pearls and nacre; River Mussels *Unionidæ*, with pearls and de and polished.

Cameo shell and shells of *Cypræa*, *Rotella*, *Oliva*, *Turritella*, &c., mounted s and jewelry, composition shell work for box covers and frames, made by gluing mosaic; cuttle-fish bone from *Sepia officinalis*, used as a pounce, as a dentifrice, as powders, for taking fine impressions in counterfeiting, and as food for birds; con-rom the stomach of *Astacus*, known as "crab's-eyes" and "crab-stones," and used as shell of king-crab, *Limulus polyphemus*, used as a boat-bailer.

Alligator leather *Alligator mississippiensis*, salted and tanned, and ured into satchels, slippers, boots, &c. (See exhibit of Tiffany & Co., and H. J. lz.) Skins of Eels, *Anguilla vulgaris*, Sturgeon, *Acipenser rubicundus*, Cod, *Gadus* Hake, *Phycis chuss*, Cusk, *Brosmius brosme*, and other species, crude, and manufac-shoes, isinglass, &c. (See exhibits of Gloucester Isinglass and Glue Co. and Russia Co.)

Isinglass (*ichthyocolla*), made from air-bladders and skins of fishes and he manufacture of fine glues and sizes, adhesive and court plasters, diamond mitation glass, and table-jelly and confectionery, in refining wines and liquors, in ng milk, in fixing the lustre of artificial pearls, and in lustreing silk ribbons, g the dried and the manufactured products) in their grades of "lyre," "heart-" leaf," and "book" isinglass. Hard and liquid fish-glue made from skins of Cod, ke, and other species; carriage axle, hats, oil-cloths, spools, &c., in the manufacture fish-glue is used. (See exhibits of Gloucester Isinglass and Glue Co. and Russia Co.)

Specimens of American commercial sponges. (See invertebrate

Oils and fats, including Seal oil in its various grades, used for g; Sea Elephant oil, crude and bleached; oil from body of whales, Grampuses, and

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Porpoises, used in the arts, for lubricating, painting, &c.; Black-fish and Porpoise jaw used in lubricating fine machinery, watches, clocks, and guns; Grampus oil, used for lubricating fine machinery; crude and refined Sperm oil, used for illuminating, lubricating, as an emollient in medicine, for lip-salves, and in the manufacture of spermaceti; crude and refined spermaceti with samples of candles from it: Alligator oil, made in Florida; oil from various species of fish, as Sunfish, *Mola rotunda*, currier's cod liver oil, medicinal cod liver oil; stearine from liver-oil of codfish; oil from liver of Cusk, *Brosmius brosme*, Haddock, *Melanogrammus aeglefinus*, Pollock, *Pollachius virens*, &c.; Menhaden oil, used in currying leather, in rope-making, for lubricating, for adulterating linseed-oil, as a paint oil, and exported to Europe for use in the manufacture of soap and for smearing sheep; Oulachan oil, used by the Indians of the North-west coast for food and illumination; oil of Squid, *Ommastrephes illecebrosus*.

150. Mammal perfumes; ambergris from sperm whale, used in the preparation of fine perfumery.

151. Chemical products and agents employed in the arts and medicine; fish extract of seawrack, *Fucus vesiculosus*, extensively sold under the name of "Antifat."

152. Fertilizers in the preparation of which fish are used, including Menhaden guano, crude and ground, guano made from fish skins, and from fish heads and bones. Series of preparations illustrating the manufacture of soluble Pacific guano, including crude and crushed, and ground South Carolina phosphates; crude Navassa phosphate, Sicily sulphur for the manufacture of sulphuric acid; Stassfurth kanite, used in preservation of scrap, crude Menhaden scrap, and scrap dried by the Hogle patent drying machine.—(See exhibits of Quinnipiac Fertilizer Company, The George W. Miles Company, Winfield S. Dunan, W. A. Able, and others.)

## Section H.—FISH CULTURE.

### XXXV.—Apparatus and Methods of Fish Culture.

153. A map showing the operations of the United States Fish Commission from 1871 to the present time, the location of the hatching stations belonging to the United States Fish Commission, and to the Fish Commissions of the several States; and the dates of the establishment of the State Commissions. It also shows the locations where young fish have been planted, each species being designated by a peculiar symbol:—

List of Hatching Stations.—The following is a list of the hatching stations operated by the United States Fish Commission in 1883: (1) Grand Lake Stream, Maine, station for collecting eggs of the Schoodic Salmon *Salmo salar* var. *sebago*. (2) Bucksport, Me., station for collecting and hatching eggs of the Atlantic Salmon, *Salmo salar*, and for hatching eggs of White-fish, *Coregonus clupeiformis*, to be distributed in the waters of the State. (3) Wood's Holl, Mass. Permanent coast-station, which serves as a basis of operation for scientific investigations of the Commission, and as a hatching station for eggs of the Cod, *Gadus morhua*, and other sea-fishes. (4) Gold Springs Harbour, Long Island, New York. Station for hatching eggs of various species of Salmonidæ for distribution in New York and elsewhere. (5) Havre de Grace, Maryland Station, located on Battery Island, in the Susquehanna River, for the purpose of collecting and hatching eggs of the Shad, *Clupea sapidissima*. (6) Washington, District of Columbia. (*a*) National Carp Ponds. Ponds for the propagation of the various varieties of the Carp *Cyprinus carpio*, and the Gold-fish, *Cyprinus auratus*, the Golden Ide, *Idus melanotus* var. *auratus*, and the Tench, *Tinca vulgaris*. (*b*) Arsenal Ponds. Ponds for the propagation of Carp *Cyprinus carpio*. (*c*) Navy Yard. Station for collecting and hatching eggs of the Shad, *Clupea sapidissima*. (*d*) Central hatching station. A station fully equipped for scientific experiments connected with the propagation of fishes. The station is also provided with apparatus for hatching the eggs of all the more important species, including light, heavy and adhesive eggs. It is the principal distributing station of the Fish Commission, for the eggs and young fish to all portions of the United States. (7) Wytheville, Virginia. A station for hatching eggs of Brook-trout, *Salvelinus fontinalis*, and California Trout, *Salmo iridei*. (8) Saint Jerome's Creek, Point Lookout, Maryland. A station for the artificial propagation of the Oyster, *Ostrea virginiana*, the Spanish Mackerel, *Scomberomorus maculatus*, and the Banded Porgy, *Chætodipterus faber*. (9) Avoca, North Carolina. A station on Albemarle

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, at the junction of Roanoke and Chowan Rivers for collecting, hatching, and distributing f the Shad, *Clupea sapidissima*, Alewife, *Clupea vernalis* and *C. æstivalis*, and Striped *Roccus saxatilis*. (10) Northville, Michigan. A hatching station for the development stribution of eggs of the White-fish, *Coregonus clupeiformis*. This station is also provided nks and ponds for the spawning, hatching, and rearing of Brook-trout, *Salvelinus fonti-* nd California Trout, *Salmo iridea*. (11) Alpena, Michigan. A station for the collec- nd development of the eggs of the White-fish. *Coregonus clupeiformis*. (12) Baird, nia. (*a*) Salmon station. A station on the McLeod River for the development and ation of eggs of the California Salmon, *Oncorhynchus chouicha*. (*b*) Trout Ponds. A near Baird for collecting, developing, and distributing eggs of the California Trout, *iridea*. (13) Clackamas River, Oregon. A station on Columbia River for collecting and g eggs of the California Salmon, *Oncorhynchus chouicha*.

4. Hatching table, in three parts, showing models of the various kinds of g apparatus used in the United States, in actual working order, the water being supplied ns of a gas pumping-engine which forces it into closed pipes with a pressure of 15 lbs. to are inch. Stop-cocks are placed at frequent intervals in these pipes, and are connected he hatching apparatus by means of rubber tubing. The apparatus is supplied with and artificial eggs to give a better idea of its workings. The first compartment contains sed apparatus, the next the trough and other apparatus requiring running water, while rd is arranged as a basin or artificial lake for showing the floating apparatus and other sed in open streams. A McDonald fish-way is placed at the end of the table to conduct ste water to the tank below, from which it is again carried to the pump.

5. A figure representing a man in the act of taking eggs from an Atlantic in a pan in which they are to be impregnated. By his side are casts of a ripe male and salmon with the abdominal walls removed to show the ovaries and spermaries in position.

6. A model of the United States Fish Commission steamer "Fish Hawk," y Pusey & Jones, of Wilmington, Delaware.

7. Sectional model of the United States Fish Commission steamer "Fish ," on a scale of two inches to the foot, the hatching deck being properly equipped with tching apparatus, other apparatus being suspended from the vessel's side.

8. Models of several of the most important hatching houses in the United including the following:—Model of hatching house built at Druid Hill Park, Baltimore, and, in 1875, under the direction of Major T. B. Ferguson, then State Commissioner of ries. The interior of this model is fitted up with miniature hatching apparatus, showing angements for actual work. It contains Ferguson hatching jars, Coste trays, Williamson ng troughs, Clark hatching troughs, Holton hatching boxes, Green hatching boxes, a, a reservoir tank provided with filters, and a porcelain-lined sink. Model of hatching at United States salmon-breeding station at Bucksport, Maine, built under the direction Charles G. Atkins, with movable roof for showing the interior, which is provided with s for hatching eggs of the Salmon. The water enters the troughs through a feed-pipe ing along the side of the room and escapes by pipes through the floor. Model of United hatching house at Northville, Michigan, built under the direction of Mr. Frank N. Clark, tching eggs of Lake Trout, Brook Trout, California Trout, California Salmon and White- The interior of this hatchery is provided with miniature hatching troughs and jars, while grounds adjacent are shown several of the fish tanks and ponds.

9. Maps showing topography of the land adjacent to several of the more ant hatching stations of the United States Fish Commission, including the national Carp at Washington, District of Columbia, the United States reservation for fish-cultural pur- on the McCloud River, California, the salmon-breeding stations at Grand Lake Stream, ucksport, Maine, and the hatching station at Northville, Michigan.

10. Series of 30 × 40 inch photographs, retouched with Indian ink, ng several of the more important hatching stations and the more interesting features of ultural work, such as taking and impregnating the eggs, tagging the fish, and the process nipulation of the eggs and young fish at the hatchery.

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**161.** Series of fish-hatching apparatus, including all of the more impor kinds used in the United States. Each specimen in this series is of actual size and in wo order.

**162.** Series of accessory apparatus used at fish-hatching stations such as p skimming-nets, pails, dippers, and lanterns.

**163.** Series of apparatus for the transportation of eggs and young f including all of the more important kinds now used by leading American fish culturists.

**164.** Series of fish eggs in alcohol. This series includes the eggs of al one hundred of the more important food-fishes taken within the limits of the United State

### XXXVI.—Eggs and Young Fishes.

**165.** Series of fish-eggs showing daily development of the embryo from t unimpregnated egg to the newly hatched fish. This series embraces all of the more impor species hatched by the U.S. Fish Commission, including Brook Trout, Lake Trout, Atla Salmon, Schoodic Salmon, California Salmon, Rainbow Trout, Rangeley Trout, White-fi Shad, Mackerel, Cod, Alewives, and Yellow Perch.

**166.** Series of young fish showing the rate of growth. This series includ the following species:—Brook Trout, Rainbow Trout, California Salmon, Atlantic Sal White-fish, and Shad.

### XXXVII.—Fish Ways.

**167.** Models of all the more important styles of fish-way used in the Uni States, seventeen in number. Illustrations of the Shotwell process for cleansing streams f the refuse of gas-works.

### XXXVIII.—Fish Culturists.

**168.** Photographs of State Fish Commissioners.

**169.** Photographs of officers and members of the American Fish Cul Association, and other representative fish culturists.

## Section I.—INVESTIGATION OF THE WATERS AND RESEARC

### XXXIX.—Deep-Sea Research.

**170.** A nearly complete series of the deep-sea sounding and dredgi appliances, accessory apparatus, and instruments for physical observations, used by the Un States Fish Commission, and United States Coast and Geodetic Survey, including deep-sea trawls and dredges, towing-nets, sieves, water cup, sounding machine with piano sounding line and improved reversible metal cases for the Negretti and Zambra dee thermometers. Models and photographs of the United States Fish Commission sta "Albatross" and "Fish Hawk." Series of plates illustrating the deep-sea sounding dredging appliances of the United States Coast Survey steamer "Blake."

**171.** Five relief models, showing the configuration of the sea bottom of the eastern coast of North America from Newfoundland to Mexico.

**172.** Chart showing the dredging operations of the United States Fi Commission, 1871–1882.

**173.** Series of specimens of marine invertebrates, obtained from the deep waters off the north-eastern coast of the United States, since 1878, by the United States Fi Commission and the Gloucester Fishing Vessels, and representing some of the more interesti features of the fauna of that region. Specimens of rock formation from the deeper waters the New England Coast.

### XL.—Investigation of the Fresh Waters.

**174.** Collections of crayfish and fresh water sponges from the rivers of th United States.

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## Section K.—Literature.

### XLI.—Books.

75. Publications of the United States Fish Commission. Publications of State Fish Commission. Publications of the United States Government relating to the fisheries. Principal works of American writers on the marine and fresh water fauna of the United States, the geographical distribution, development, and life history of aquatic animals, in general, investigations upon seas, lakes, and rivers, and their inhabitants.

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## COLLECTIONS DISPLAYED BY SPECIAL EXHIBITORS.

[In special catalogue of the United States Exhibition will be found many notes explanatory of the articles entered in competition by Special Exhibitors. The numbers in parenthesis refer to the classes in the official scheme.]

**BBE, W. A.**, New Bedford, Massachusetts. Samples of "Abbe's fish (29.) Underground or crude Menhaden scrap. Fine Ground Menhaden scrap. Fine ground Menhaden scrap.

**AMS, MAYHEW**, Chilmark, Massachusetts. Patent chock for whale (6.)

**ASSIZ, ALEXANDER**, Museum of Comparative Zoology, Cambridge, Massachusetts. Publications relating to fishes and marine invertebrates. (See also Museum Comparative Zoology, Cambridge.) (51, 61.) Plans of biological laboratory at Newport, Island. (40.)

**NSWORTH, STEPHEN H.**, New York. Spawning-race for idae. (35.)

**ASKA COMMERCIAL COMPANY**, San Francisco, California. House, C. M. Sampson & Co., 64 Queen Street, Cannon Street, E.C.) Two Pacific tusks. (32.) One 41 inches long and weighs 12¼ pounds. One 41 inches long and 12½ pounds. Exhibit of fur-seal skins raw and dressed. (32.)

**BANY BEEF PACKING COMPANY**, 372 Greenwich Street, New City. Fish oils and fertilizers. (29.) Fish oil. Fertilizers and bone dust. Cooked tions in cans. (26.) Canned Sturgeon (called Albany Beef), 1-pound cans.

**DEN, CHARLES**, Randolph, Massachusetts. Exhibit of foods prepay the Alden evaporating process. (26.)

**LEN, J. A.**, Museum of Comparative Zoology, Cambridge, Massachusetts. Illustrating the geographical distribution of the seals and walruses. (55.) Monograph Pinnipeds of North America. (60.)

**LEN, F. S.**, New Bedford, Massachusetts. Bomb-lances formerly used the whaling rifle, &c. (1.)

**LEN, FREDERICK S.**, Cuttyhunk, Massachusetts. Models of Life-patented April 26, 1881). (6.) Hand-capstan or windlass. (6.) Hand-capstan. (6.) n or windlass. (6.) Sword-Fish iron. Improved pattern. (1.)

**ERICAN ANGLER (THE)**, W. C. Harris, Editor, New York City. "The American Angler." (60.)

**ERICAN FIELD (THE)**, N. Rowe, Editor, Western Office, 155 and arborn Street, Chicago, Illinois. Bound volume of the American Field. (60.)

**ERICAN FISH-CULTURAL ASSOCIATION**, New York City. Shepard Page, President. Annual reports and menus of annual dinners. (57.) its of its members.

**ERICAN NET AND TWINE COMPANY**, Boston, Massachusetts. it of Nets and Seines, and Twine used in their manufacture. (1 and 8.)

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**AMERICAN SHIP WINDLASS COMPANY,** Providence, Rh Island. Working model of the Providence steam capstan windlass. (6.)

**AMS, MAX,** 372 and 374, Greenwich Street, New York City. Prep tions in spices, vinegar, &c. (26.) Eels in Jelly, in cans. Smoked preparations. Smoked Eels. Pickle or brine salted preparations. (27.) American Caviare (Sturgeon Cooked preparations in cans. (26.) Canned Sturgeon (called Albany Beef).

**ANNIN, JAMES, JUN.,** Caledonia, New York. Box for the transport of fish ova. (35.) Case containing 3000 living eggs of the Brook Trout. *Salvelinus nalis.* (36.)

**ATKINS, CHARLES G.,** Bucksport, Maine. Apparatus used in artificial propagation of various species of Salmonidæ. (35.) Series of eggs and yo Atlantic Salmon, showing daily growth from the newly-impregnated egg to the fry weeks old. (36.) Model of Pike's spiral fish-way, with modifications; also model of Bangor fish-way. (37.)

**ATWATER, PROF. WILBUR O.,** Middletown, Connecticut. Dia and publications relating to the nutritive value of fish. (25.)

**ATWOOD BROTHERS,** Clayton, New York. Working model of At patent centre-board for boats and canoes. (6.)

**BAGNALL & LOUD,** Boston, Massachusetts. Fittings for fishing w Harcourt's patent improved inside iron-strapped block. (6.) Sheave-roller bushing Lug-roller bushing. (6.) Improved lug-roller with iron sheave. (6.) Gaff-topsail ch downhaul attachment. (6.) Improved snatch-block. (6.) Leader for peak halyards Improved sheet-block with boom buffer combined. (6.) Improved trawl roller. (6.) proved seine block. (6.)

**BAILEY, ARTHUR H., & CO.,** Boston, Massachusetts. Cooked parations in cans. (26.) Fresh Bluefish. Fresh Sea Bass. Fresh Mackerel. Fresh Sea Salmon. Ocean Trout. Smoked preparations. (26.) Finnan Haddies. Kippered ring. Preparations in spices, vinegar, &c. (26.) Mackerel in Mustard Sauce. Mack Tomato Sauce. Ocean Trout in Mustard Sauce. Ocean Trout in Tomato Sauce. Na Sturgeon in Piccalilli Dressing.

**BAILIE, WILLIAM L., PASSED ASSISTANT ENGINEER U** Steamer "Fish-Hawk." Self-registering thermometer for deep-sea research. (40.)

**BARTLETT, I. H. & SONS,** New Bedford, Massachusetts. Fal whale-boat, rigged for use. (4.) Arctic and Humpback Whale-bone. (32.)

**BARTLETT, JOHN,** Cambridge, Massachusetts. Bibliograph Angling. (60.)

**BEARDSLEY'S SONS, J. W.,** 179 West Street, New York City. salted preparations. (26.) Beardsley's shredded Codfish. Boneless Codfish, Beehive Boneless Herring, Star brand.

**BEAN, TARLETON H.,** United States National Museum, Washi Map showing geographical distribution of the food-fishes of Alaska. (55.) Public ichthyology and the fisheries. (55, & 61.)

**BENEDICT, J. E.,** United States Steamer, "Albatross." Rake for collecting Annelids and other mud-burrowing invertebrates. (40.)

**BLACKFORD, EUGENE G.,** Fulton Street, New York City. food-fish on ice, the supply received from week to week. (51.) Invitations to annual openings."

**BLISS, JOHN, & CO.,** New York City. Nautical instruments. Taffrail log. (Complete.) Parallel rules: two sizes, new style. American chronometer, Bliss and Co., No. 2768"—described in accompanying "Nautical Almanac."

**BOOTH, A.,** Baltimore, Chicago, and Astoria. Preparations in spices vinegar, &c. (26.) Oysters in glass. Cooked preparations in cans. (26.) Canned O Canned Salmon. (Oval brand.)

**ANDERSON, ABBOTT, & ANDERSON,**

MANUFACTURERS OF EVERY DESCRIPTION OF

**INDIA-RUBBER**

**For Mechanical, Scientific, and Domestic purposes; also Manufacturers of Leather and Canvas Hose, Leather, India-Rubber, and their Patent Cerofilum Belting, Sheet Rubber, Tubing, &c.**

**CKETT, E. A.**, Winchester, Massachusetts. Model of Fish-way, with at right angles, provided with a submerged piece of cob-work, surmounted by grating, he fish to the mouth of the way. (37.) Floating box for use in open stream. (35.)

**CKETT, WALTER M.**, Boston, Massachusetts. Paintings of fish. (51.)

**ND, JUNIUS A.**, Norwich, Connecticut. Bomb-lances and darting killing whales. (1.)

**WER, JAMES D.**, Muncy, Pennsylvania. Model of fish-way, with sloping floors; also model of oblique groove fish-way. (37.)

**WN, JAMES TEMPLE.**, United States National Museum, on. Collection of whaling harpoons, lances, guns, bombs, &c., gathered for the Fish on at New Bedford in 1882. (1.) (The entire whaling collection has been arranged rown.)

**AN, OLIVER N.**, Occokeek, Maryland. Floating box for use in open (35.)

**NHAM & MORRILL**, Portland, Maine. Smoked Preparations. (26.) Haddies, in 1-pound cans. Cooked preparations in cans. (26.) Canned Lobsters, and Clams.

**TRICK, J. T.**, New Bedford, Massachusetts. Ship bread carried by . (22.)

**PENTER, CHARLES**, Kelley's Island, Ohio. Camel's-back buoy ts. (6.)

**TURY COMPANY, THE**, New York City, Art Department, A. W. perintendent. Illustrating the United States Life-Saving Service. (9.) 1. Off to a . Life-saving station. 3. Drill, &c., in surf-boat. 4. Launching surf-boat. 5. Night . Burning a signal. 7. Hauling mortar-car. 8. Surf-man with life-belt. 9. Firing r. 10. Breeches-buoy in operation. 11. Breeches-buoy. 12. Self-righting life-boat. ighting life-boat under sail. 14. Life-saving dress. 15. Tally-board and whip-block. citation, ejecting water. 17. Resuscitation, restoring respiration. 18. Medicine chest. room. Pictures of other marine scenes. 20. A glimpse of the sun. 21. Hove to for 22. Launching the boat. 23. Taking a Porpoise aboard. 24. Sebatis in a perilous 25. Beaching the canoe. 26. Reefing the mainsail.

**SE, A. J.**, Boston, Massachusetts. Chase's Cold Blast Refrigerator. (33.) Monitor Display Refrigerator. (33.)

**SE, OREN M.**, Detroit, Michigan. A glass hatching jar, provided ss tube, by means of which the water is delivered at the bottom and allowed to pass rough the eggs. (35.)

**STER, CAPTAIN H. C.**, Noank, Connecticut. Walrus tusks scrim- nd frame made of walrus ivory. (32.) Cylinder and box used in hatching floating employed in hatching cod at Cape Ann in 1878. (35.) Rake-dredge, and other used in deep-sea research.

**RK, A. HOWARD**, United States National Museum, Washington. trating the past and present locations of the whaling-grounds of the world; publications statistics. (55 & 61.)

**RK, FRANK N.**, Northville, Michigan. Series of eggs and young ving development and growth as follows: Brook Trout, Rainbow Trout, Schoodic nd White-fish. (36.) Various kinds of apparatus used in hatching White-fish and ecies of Salmonidæ; also box for the transportation of fish ova. (35.)

**RK, JAMES B.**, Chester, Connecticut. Working model of W. N. tent rudderhanger. (6.)

**E, LUTHER**, New Bedford, Massachusetts. Nickel-plated whaling ts. (1.)

**ANDERSON, ABBOTT, EN ANDERSON,**

**37, Queen Victoria Street, Londen, Engeland,**

tsluitende Fabrikanten, en Leveranciers aan de Londensche Politie, van den EBREVETEERDEN WEL AFGEWERKTEN WATERPROEF SCHOU- ERMANTEL ten dienste der Politie, zooals deze wordt gedragen door de ornaamste Engelsche, Iersche en Schotsche Politie-corpsen.

**COLLINS, A. S.**, Caledonia, New York. Spawning race for Salmonidæ. (3

**COLLINS, CAPTAIN J. W.**, Gloucester, Massachusetts. Drawings fishing scenery (see also under Elliott). Charts of the fishing grounds. Collins' impro adjustable marine drag. (6.) Collins' patent fog alarm. (6.) This invention consists of upright cylindrical bellows of stout grain leather, supported by and working upon three h rods, which are fastened at the lower ends to a strong wooden pedestal, and the upper end which are secured by means of screw caps to a wooden top, to which also is attached the u part of the bellows. This wooden top or cap-piece is surmounted by a brass cone, havi hole in its apex, into which is screwed a reed horn. The bellows is collapsed or disten by means of an iron lever working on a hinge attached to the wooden base. By moving lever the air in the bellows is driven with great force through the horn at the top. A heavy sound is obtained when a large horn is used, while a small horn can be blown fullest capacity with very slight exertion on the part of the operator. Dimensions: Diam of base, 2 feet; thickness, 4 inches; diameter of wooden top, 19 inches; thickness, 1½ inch diameter of bellows (No. 56,955), 15 inches; height, 20 inches; height of brass cone, 6½ inch diameter of cone (at base), 9 inches; thickness of brass rods, ⅜ of an inch; length of leg feet. This implement was originally designed for use on fishing vessels, especially such as employed in the line-trawl fishery. In the latter fishery the men go out in dories long tances (one to three miles) from the schooners that are lying at anchor, and the prevalence dense fogs in summer, and snow in winter, causes the loss of many fishermen, who go because they are unable to hear the horns which are ordinarily employed. The advantage this fog alarm are that it can be heard farther than any horn now in use on sailing (this having been proved by actual test at sea); that the material of which it is made the simplicity of its construction, render it less liable to get out of repair than other horns; that it may be at all times operated with comparatively slight physical exertion without any of the exhaustion that results from blowing a horn with the mouth; and that it is adapted for use on all kinds and classes of vessels. Model of ideal fishing (See Collective Exhibit.) Publications relating to the fisheries. (60.)

**COMSTOCK, HARRY**, Fulton, New York. "Flying Helgramites" bass bait. (16.)

**CONKLIN, CAPTAIN B. F.**, Jamesport, New York. Sketches illustr the Menhaden fishery, including (57.) 1. Setting the Seine. 2. Hauling the seine. 3 S ing out the fish. 4. Floating factory, Algonquin. 5. Boats going out to fishing g 6. Working to windward of shoal. 7. Encircling the school. 8. Pursing, and fish str the seine. 9. A loaded carry-away boat in good breeze. 10. A big strike, &c.

**CONROY & BISSETT**, 65 Fulton Street, New York City. 1 Hexag split bamboo Salmon rod, German silver mountings, 18 ft. long. (14.) 1 ditto Grilse rod, G silver mounting, 15 ft. long. (14.) 1 ditto Trout and Bass fly rod, German silver mou 12 ft. long. (15.) 1 ditto Trout and Black Bass fly rod, German Silver mountings, 11 ft. (15.) 1 ditto Saint Lawrence rod, German silver mountings 10 ft. long. (15.) 1 ditto McG Black Bass rod, German silver mountings, 11½ ft. long. (15.) 1 ditto California g making 3 distinct rods, German silver mountings, 8½ to 12½ ft. long. (15.) 1 ditto "New or heavy Bass rod, ash butt, agate tube top. (15.) 1 ditto "Holberton" fly rod, 2 p short ash butt. The joints of this rod are contained in the landing-net handle; the folding landing net can be carried in the angler's pocket. (15.) 1 ditto "Henshall" Bl minnow rod, 8½ to 9 ft. long. (15.) 1 ditto southern Bass or Weak-fish rod, 9 to 9½ ft. long.

**COOK, H. & S., & COMPANY**, Provincetown, Massachusetts. Bu model of Grand Bank fishing schooner "Lizzie W. Matheson." (4.)

**CUTTING PACKING COMPANY**, San Francisco, California. Co preparations in cans. (26.) Fresh Salmon from California, Oregon, and Alaska str This exhibit contains Alaska Salmon, probably the first ever shipped abroad. One contains one fish, live weight eighty-six pounds; dressed, sixty-five pounds; the larg record on this coast; caught at the company's cannery, at the mouth of the Kuiloff Alaska, July 22, 1882.

ANDERSON, ABBOTT, AND ANDERSON'S

PORTABLE INDIA-RUBBER BATHS

Fold into very small compass.

37, QUEEN VICTORIA STREET, LONDON, E.C.

**APTAIN W. H.**, United States Coast Survey, Washington. ›ographical distribution of fur-bearing animals of Alaska, charts and publi- hydrography, meteorology of the North Pacific, and upon its marine faun

**'RANK E.**, Gloucester, Massachusetts. Davis' Standard Row- s and polished brass; twenty specimens. (6.)

**DER, W. G.**, Easton, Maryland. Spawning-box for Salmonidæ water species.

**S, D. P.**, Buffalo, New York. Self-righting, Self-baling, Self- Boat. (9.)

**. W., & COMPANY**, Gloucester, Massachusetts. Exhibit of fish d guano. (27 and 29.) Pure Cod Liver oil for medicinal use. Blackish oil, rocco. Cod oil,—(i.) "Newfoundland," for tanners' and curriers' use. ," for tanners' and curriers' use. (iii.) "Grand Bank," for tanners' and iv.) "Shore," for tanners' and curriers' use. Menhaden oil, "cold pressed," d curriers' use. "Cod oil stearine," for tanners' or soap-makers' use.

**LL, J. T.**, Bath, Maine. Cable used by fishing vessels. (5.)

**WINFIELD S.**, Baltimore, Maryland. Exhibit of Menhaden (29.) 1. Unground or crude Menhaden scrap; made of fish two year old and e fish. 2. Ground Menhaden scrap; made from the same stock as No. 1. crude Menhaden scrap; made of fish not over one year old, called small fish. haden scrap; made of same stock as No. 3. 5. Samples of Menhaden oil;

**R. EDWARD**, Washington. Series of eggs of Codfish, showing ent from the unimpregnated egg to the time of hatching. (36.) Publications fisheries, fishing statistics, and fish culture.

**, SELMAR**, New Bedford, Massachusetts. Whaling gun. (1.)

**T, HENRY W.**, Washington. Series of water-colour sketches, fur-seal fisheries of Alaska; report upon the natural history and of the fur l fisheries of Alaska; sketches in Indian ink illustrating fisheries of various ited States.

**T, HENRY W., & COLLINS, J. W.** Pictures of various ew England fisheries.

**ON, J. H.**, Peabody Museum, Yale College, New Haven, Con- els of Giant Squid and Giant Octopus shown in the Collective Exhibit. (16.)

**TH, F. M.**, Waldoboro, Maine. Model of fish-way, with auto- egulating the supply of water. (37.)

**NKS & COMPANY**, New York City. Scales used in weighing ntific investigation. (34.)

**V, PROF. W. G.**, Harvard College, Cambridge, Massachusetts. bit of North American Algæ with publications. (42.) Investigations of the ng dried fish, with specimens of red fish and red salt. (42.)

**WALTER**, Museum of Comparative Zoology, Cambridge, Massa- lications upon marine invertebrates. (61.)

**ON, ALBERT**, 65 Fulton Street, New York City. Lanterns or Anglers' use. (19.)

**ON, MAJOR T. B.**, Assistant United States Fish Commissioner, Various kinds of apparatus used in hatching heavy eggs; also transportation ish. (35.)

**, J. WALTER**, Museum of Comparative Zoology, Cambridge, Publications upon marine invertebrates. (60.)

RSON, ABBOTT, & ANDERSON'S
een Victoria Street,
n, E.C.
LAWN TENNIS
BATS,
BALLS, SHOES,
NETS, POLES, BAGS.
SETS COMPLETE.

**FOREST AND STREAM PUBLISHING COMPANY**, 39 and Park Row, New York City. A series of nineteen bound volumes of the weekly paper "Fo and Stream and Rod and Gun." (60.)

**FOSTER, AL.**, New York City. Placards advertising fishing excursi in the vicinity of New York.

**FREEMAN, MRS. CAPT. J. H.**, Wellfleet, Massachusetts. Cr sketch of Mackerel. (51.) Oil Painting of Salmon Trout. (51.)

**FULTON MARKET FISHMONGERS' ASSOCIATION**, New Yo City. Portraits of its members. (33.)

**GLOUCESTER ISINGLASS & GLUE COMPANY**, Gl Massachusetts. Exhibit of Liquid Isinglass for adhesive paper, labels, and e isinglass for court plasters; Pure Fish Glues (hard and liquid, free from salt), for belting, roll cots, and card pelting, &c. (29.)

**GOODE, PROF. G. BROWN**, Smithsonian Institution, Washi Charts showing geographical distribution of fishes. (55.) Publications relating to ology and the fishermen. See also under Charles Scribners, Sons. (Game Fishes.)

**GREEN, MONROE A.**, Mumford, Monroe County, New York. the transportation of fish ova. (35.)

**GREEN, SETH**, Rochester, New York. Samples of barbless hooks Trout and Bass fishing. (18.) Hybrid between California Salmon and Brook Trout; between Salmon Trout and Brook Trout. (36.) Floating Hatching box for use in streams. (35.)

**HARGER, OSCAR**, Peabody Museum, Yale College, New Haven, Co ticut. Publications upon Isopod Crustaceans. (61.)

**HAYWOOD, WILLIAM P.**, West Creek, Ocean County, New Jer Model of Oyster Tongs. (2.)

**HENDLEY, J. E.**, United States National Museum, Washington. cast of Negro fishermen. (21.) (The lay figures in the collective exhibit of the States, with the exception of the whalemen, were made by Mr. Hendley.)

**HIGGINS & GIFFORD**, Gloucester, Massachusetts. Higgins Gifford's life-saving surf-boat. (9.) Model of life-boat. (9.) Of fish wharf. (7.)

**HILGARD, PROF. J. E.**, Superintendent U.S. Coast Survey, Washi Ocean salinometer and optical densometer. (40.)

**HILL & CO., L. S.**, Grand Rapids, Michigan. Frame containing of Hill's Spoon Baits. (14–16.) Frame containing an illustrated card of Hill's commendations, &c. (14–16.)

**HINE & CO.**, 13 and 15, Doyers Street, New York City. Cooked parations in cans. (26.) Terrapin Soup and Stew. Green Turtle Soup and Stew. Halibut, and Oysters.

**HOLBERTON, WAKEMAN**, 65 Fulton Street, New York City. length Holberton Fly hooks. (14–16.)

**HOLMES, FRANK**, Chagrin Falls, Ohio. Stranahan folding boat, length 10 feet. (20.)

**HOLMES, MARSHALL H.**, 1123 Arch Street, Philadelphia. Life-Preserving Bed, constructed of solid cork and cork shavings, and available as a single person. (9.)

**HORNADAY, W. T.**, Taxidermist, United States National Mu Washington. Specimens of Taxidermy. (53.) Walrus Head. Quinnat Salmon (in tive exhibit).

**ANDERSON, ABBOTT, & ANDERSON'S**
**FISHING BROGUES**
**Are Unsurpassed.**
**37, Queen Victoria Street, London, E.C.**

**CHTHYOPHAGOUS CLUB**, New York City. John Foord, Esq., ident. Collection of menus of annual dinners of the club. (60.)

**RVING, THOMAS A.**, Gloucester, Massachusetts. Rigged Model of e-masted Fishing Schooner. (4.)

**ORDAN, PROF. DAVID S.**, Indiana University, Bloomington, ana. Works on Ichthyology. (56).)

**OSEPH, DAVIS & CO.**, 233 W. Seventh Street, Cincinnati, Ohio; and oy Works, 6 Kennington Park Road, S.E., London. American Forecast Barometer. (6.)

**EWIS, W. K. & BROS.**, Boston, Massachusetts. Cooked preparations ns. (26.) Lobsters. Clams. Mackerel. Fish-chowder. Cham-chowder. Fishermen's (22.) Roast Mutton. Roast Beef. Roast Turkey. Roast Chicken.

**OCKINGTON, W. N.**, Philadelphia, Pennsylvania. Publications on ne fishes and invertebrates. (55 & 61.)

**OOMIS, PLUMB & CO.**, Syracuse, New York. Bronze Plate Auto- Reel, for 90 feet of line, No. 1. (14–16.) Nickle Plate Automatic Reel, for 150 feet of No. 2. (14–16.)

**ORD, H. & G. W.**, Boston, Massachusetts. Exhibit of cotton netting in the manufacture of seines, traps, dip-nets, &c. (8.)

**OW, DAVID W.**, Gloucester, Massachusetts. Low's Improved Ice- ner. (33.)

**UCAS, F. A.**, United States National Museum, Washington. Exhibit affed Turtles, &c. (52.) Exhibit of stuffed Crabs and Lobsters. (51.)

**YLE, LIEUTENANT D. A.**, United States Army. Improved gun for ing connection with wreck from shore. (9.)

**cDONALD, MARSHALL**, Washington. Various kinds of apparatus in hatching adhesive floating and heavy eggs; also apparatus for the transportation of and young fish. (35.) Series of eggs and fry showing development and growth as ws: Brook Trout, Lake Trout, and White-fish. (36.) Model of counter-current fish-way, artitions being so arranged that the velocity of the current is retarded by the water being d against itself. (37.) Publications upon fish-culture.

**cGOVERN, H. D.**, Brooklyn, New York. Stuffed trout, and bug h killed it. (49.)

**cKESSON & ROBBINS**, 91 Fulton Street, New York City. Collec- of Florida Sponges. (43.) Collection of cultivated Sponges. (36.)

**cLELLAN, LIEUTENANT C. H.**, United States Revenue Marine. Improved (i.) traveller block for breeches buoy. (9.) (ii.) Block for sand anchor. (9.) Breeches buoy. (9.) (iv.) Tripod for life-saving apparatus. (9.) (v.) Tally boards for aving apparatus. (9.) (vi.) Drill or tactics for life-saving crews. (9.)

**cMENAMIN & CO.**, Hampton, Virginia. Cooked preparations in (26.) Fresh Devilled Crabs. Fresh Crab Meat. Extra selected Oysters, Lion brand. cove Oysters, Hampton Roads brand. Cove Oysters, Hampton Roads brand. Lunch ra.

**AHRENHOLZ, H. J.**, New York City. Boots and shoes made of tor leather. (32.)

**ANN, JOHN, & CO.**, Syracuse, New York. Artificial trolling spoons. 6.)

**ANN BROS.**, Chicago, Illinois. Packages for transporting oysters. (33.)

**ARSHALL, HENRY**, U.S. National Museum, Washington. Mounted of aquatic birds.

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**FISHING BROGUES**
**Are Unsurpassed.**
**37, Queen Victoria Street, London, E.C.**

**MASON, H. W.** Explosive and non-explosive projectiles for killing whales. (1.)

**MASSACHUSETTS HUMANE SOCIETY.** Reports of the Massachusetts Humane Society. (9). Medals for Life-Saving Service granted by the Massachusetts Humane Society. (9.)

**MATHER, FRED.**, New York City. Conical apparatus used in hatching eggs of the Shad; also boxes and cans for the transportation of fish and fish ova. (51) Collection of fishes from the Adirondack region, with map showing distribution of species, and report. (51, 55.)

**MATHER, Mrs. FREDERICK**, of New York City. Oil Painting of a Trout. (51.)

**MAYO, HENRY, & CO.**, Boston, Massachusetts. Preparations in spices, vinegar, &c. (26.) Soused Mackerel, 1-pound, 2-pound, 3-pound, and 4-pound cans. Cooked preparations in cans. Fresh Mackerel. Fresh Mackerel in Tomato Sauce. Fresh Mackerel in Mustard. Fresh Lobsters. Clam Chowder. Fish Chowder. Fresh Clams. Codfish balls. Fishermen's food in cans. (22.) Baked Beans, Bean-pot brand; Picnic Beans, Bean-pot brand; Green Lima Beans, Bean-pot brand; Green Lawnsdale Beans, Bean-pot brand; Green Corn, Green Peas, Fresh Pumpkin, Fresh Squash, Fresh Tomato, Fresh Succotash, Roast Beef, Roast Lamb, Roast Turkey, Roast Chicken, Beef Soup, Chicken Soup, Macaroni Soup, Mock Turtle Soup, Mutton Soup, Ox-Tail Soup, Pea-Soup, Tomato Soup.

**MEGLER, J. G., & Co.**, Brookfield, Wahkiakum County, Washington Territory. Cooked preparations in Cans. (26.) California Salmon.

**MERCHANT, GEORGE, JUN.**, Gloucester, Massachusetts. Model of Mackerel pocket. (1.) Fishermen's games and puzzles. (21.)

**MILAM, B. C.**, Frankfort, Kentucky. Milam or Frankfort Fishing Bait. (14-16.)

**MILES.** (See under THE GEORGE W. MILES COMPANY.)

**MILLS & SON, WILLIAM**, 7 Warren Street, New York City. Leonard's split bamboo rods: Salmon rod, 16 feet, 32 ounces. (14.) Salmon rod: 15½ feet, 25 ounces. (14.) Bass Bait rod: 10¾ feet, 15¾ ounces. (16.) Bass bait rod: 8½ feet, 9¾ ounces. (16.) Trout fly rod: 11½ feet, 8¾ ounces. (15.) Trout fly rod: 10½ feet, 8½ ounces. (15.) Catskill rod, 10 feet, 4⅞ ounces. (14-16.) Trunk fly rod: 11 feet, 10½ ounces. (14-16.) Combination rod. (14-16.) Salmon reels: Leonard's patent. (14.) Trout reels: Leonard's patent. (15.) Salmon reels. (William Mills & Son's new patent.) (14.) Trout reels: (William Mills & Son's new patent.) (15.) Multiplying reels: (B.H.) adjustable click, three sizes, 2, 3, and 4, in rubber and German silver. (14-16.) Braided linen lines. (B, C, C, D, E, F, G.) Silk lines: standard tapered silk (B and C), 120 yards each. (14.) Fly Lines: standard tapered silk (E, F, and G), 100 yards each. (14-16.) Braid-silk lines: standard (C, D, E, F, G, and H), 50 yards each. (14-16.) Fly lines: standard tapered silk (F), each 30 and 50 yards. (14-16.) Fly lines: standard tapered (E), each 25 and 40 yards. (14-16.) Leaders: single, double, and twisted, Nos. 1 to 8; lengths, 3 feet, 6 feet, and 9 feet. (14-16.) Frame Minnows: Nos. 2, 3, 4, 5, 6, 7, 8. (14-16.) Caledonian Minnows: Nos. 3, 4, 5, 6, 7, 8, 9, 10. (14-16.) Phantom Minnows: Nos. 5, 6, 7, 8. (14-16.) Protean Minnows: Nos. 4, 5, 6. (14-16.) Artificial Dobson; large and small. (14-16.) Artificial frogs: large and small. (14-16.) Artificial crawfish, Grasshopper, Cricket, and May-fly. (14-16.) Lone Star Bait. (14-16.) Eclipse Baits. (14-16.) Bates' Patent Spinner. (14-16.) Minnow Gauge. Many styles. (14-16.) Leonard Click reel. (14-16.) Billinghurst Reel. (14-16.) Bass and Trout Hooks. Virginia Hooks. Blackfish Hooks. Tapered-point Blackfish Hooks. Aberdeen Hooks. Sneck Hooks. Sproat Hooks. Chestertown Hooks. Central Draught Hooks. Bright Treble Hooks. Spring Shank Treble Hooks.

**MITCHELL, WILLIAM**, 26 Vandam Street, New York City. Salmon rods; five varieties. (14.) Front rods; twelve varieties. (15.) Bass rods; five varieties.

**ANDERSON, ABBOTT, & ANDERSON'S**

FOR GARDEN USE. **HAMMOCKS** FOR TOURISTS' USE.

37, QUEEN VICTORIA ST., LONDON, E.C.

Salmon reel; one sample. (14.) Trout reel; one sample. (15.) Bass reels; two les. (16.)

| | TROUT FLY RODS. | | | | SALMON RODS. | | | |
|---|---|---|---|---|---|---|---|---|
| | Length. | Weight. | Reel and Line. | Leverage. | Length. | Weight. | Reel and Line. | Leverage. |
| | *Feet.* | *Ounces.* | *Ounces.* | *Ounces.* | | *Ounces.* | *Ounces.* | *Ounces.* |
| 1 . | 12 | 9½ | 6½ | 30 | 14 feet . . | 17 | 19½ | 20 |
| 2 . | 11½ | 7½ | 5 | 26 | 16 feet . . | 26 | 22 | 47 |
| 3 . | 11 | 6½ | 4¾ | 22 | 16½ feet . . | 28 | 22 | 50 |
| 4 . | 10 | 4½ | 3½ | 16 | 17 feet . . | 30 | 22 | 64 |
| 5 . | 9½ | 4 | 3½ | 13 | 18 feet . . | 35 | 22 | 74 |

**USEUM OF COMPARATIVE ZOOLOGY,** Cambridge, Massachu- Publications upon Ichthyology and Marine invertebrates. (56 & 61.)

**ELSON, CHRESTEN,** Gloucester, Massachusetts. Patent Preservative Canvas, Manilla Rope, and Netting. (5.) Specimens of Canvas, Rope, and Netting, rved with the Fluid. (5.)

**EW BEDFORD CORDAGE COMPANY,** New Bedford, Massa- tts. Cordage used in the Whale Fishery. (1.)

**ICKERSON & BAXTER,** Boston, Massachusetts. Samples of Fish- used in Sea Fisheries, manufactured by J. W. Court & Co., Brooklyn, New York. (1.) e hooks are mostly used in the Cod, Haddock, Hake, Halibut, and Mackerel fisheries, gh the latter fishing is now conducted almost entirely with the purse seine. The central ght hooks are the latest pattern, and usually given the preference over the straight shank No. 10 central draught and No. 6281 straight shank are used for large Codfish in -line fishing, and Nos. 11, 12, and 13, and 6282–3–4 for smaller fish. No. 14 is a Grand trawl hook, and 15, 16, 17 for Haddock trawls.

**ICHOLS, B. F.,** Boston, Massachusetts. Hexagonal Split Bamboo Fish- ds. (14–16.)

Y Rods.—No. 1. 10 feet long, 3 pieces, weight 7 ounces, 2 tips, Bamboo tip case sack wood shipping case. No. 2. 11 feet long, 3 pieces, weight 8 ounces, 2 tips, Bamboo ase, sack and wood shipping case. No. 3. 11½ feet long, 3 pieces, weight 9 ounces, s, Bamboo tip case, sack and wood shipping case. No. 4. 11½ feet long, 3 pieces, weight nces, 2 tips, Bamboo tip case, sack and wood shipping case. No. 5. 12 feet long, 3 pieces, t 10½ ounces, 2 tips, Bamboo tip case, sack and wood shipping case. No. 6. 12 feet long, es, weight 12½ ounces, 2 tips, Bamboo tip case, sack and wood shipping case. No. 7. ral Rod, 11½ feet long with Fly Tip, weight 10½ ounces; and 9½ feet long, weight 9½ s, with short tip (2 feet long), for Bait Fishing or Trolling. This is a very handy rod, is ble for Bass or Trout, with the fly tips (of which there are two), and Bait Fishing or ing, with the short tip; making the rod in 3 pieces, Bamboo tip case, sack and wood ing case.

ack Bass Rods.—No. 8. 10 feet long, 3 pieces, weight 9½ ounces, ring guides, reel-seat grasp, 2 tips, Bamboo tip case, sack and wood shipping case. No. 9. 10 feet long, 3 s, weight 10 ounces, standing guides, reel-seat above grasp, 2 tips, Bamboo tip case, and wood shipping case. No. 10. 8½ feet long, 2 pieces, weight 9½ ounces, standing s, reel-seat above grasp, 2 tips, grooved wood case, sack and wood shipping case.

Striped Bass Rods.—1 rod, 8 feet long, 2 pieces, weight 19 ounces. 1 rod, 8½ feet long es, weight 20 ounces. 1 rod, 9 feet long, 2 pieces, weight 25 ounces. 1 rod, 8 feet long, es, weight 20 ounces. 1 rod, 8½ feet long, 3 pieces, weight 22 ounces. 1 rod, 9 feet long, es, weight 25 ounces.

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**For Mechanical, Scientific, and Domestic purposes; also Manufacturers of Leather and Canvas Hose, Leather, India-Rubber, and their Patent Cerofilum Belting, Sheet Rubber, Tubing, &c.**

SALMON RODS.—1 rod, 16 feet long, 3 pieces, weight 26 ounces. 1 rod, 16½ feet lo 3 pieces, weight 27 ounces. 1 rod, 17 feet long, 3 pieces, weight 28 ounces. 1 rod, 17½ feet lo 3 pieces, weight 30 ounces. 1 rod, 18 feet long, 3 pieces, weight 32 ounces.

GRILSE RODS.—1 rod, 14 feet long, weight 22 ounces. 1 rod, 14½ feet long, weight 23 ounc 1 rod, 15 feet long, weight 24 ounces. All rods have full German silver reel-plate and mou ings, and grooved cases covered with cloth and cloth sacks. All above rods have two t duplicate.

CALEDONIA FLY RODS.—No. 1. 9 feet 4 inches long, weight 5½ ounces, 3 pieces, 2 t No. 2. 9 feet 8 inches long, weight 6 ounces, 3 pieces, 2 tips. Full German silver mounti grooved cases, &c.

THE TOURIST COMBINATION ROD.—12 feet long, in 4 pieces, weight 13 ounces, with c butt-joint, and extra reversible grasp and reel-seat (to be used with reel above or below hand), and extra short tip for trolling or bait fishing, and extra long butt-joint to b instead of first and second joint making a 9 feet 7 ounce fly-rod, making in all 8 pieces, four regular and perfect rods, all in a cloth-covered grooved case 3 feet 3 inches lo weighing about 4 pounds when packed. It has full German silver mountings.

**OLD COLONY MILLS,** Plymouth, Massachusetts. Samples of Co used on fishing-vessels. (5.)

**OREGON PACKING COMPANY,** J. W. and V. Coolk. Propri Portland, Oregon. Cooked Preparations in cans. (26.) Canned Salmon.

**OSGOOD, N. A.,** Battle Creek, Michigan. Portable Folding Co Boat. (20.) Length, 12 feet; width, 3 feet; height, 1 foot. Folding Minnow Crate. (

**OSTERMOOR, H. D., & SON,** 36, Broadway, New York City. saving Mattress. (9.)

**PACKARD, PROF. A. S., JUN.,** Providence, Rhode Island. Publi tions upon Marine Invertebrates. (61.)

**PAGE, E. W., & CO.,** 69, West Street, New York City. Exhibit oars used on fishing and whaling vessels. (6.)

**PALMER, JOSEPH,** U.S. National Museum, Washington. (51 & Casts of seal and fish (the entire collection of casts of cetaceans, reptiles, and fishes in collective exhibit of the United States was made by Mr. Palmer).

**PARKER, JOEL C.,** Grand Rapids, Michigan. Hatching box w clockwork attachment for supplying motion. (35.)

**PARSONS, WILLIAM B.,** Rockport, Massachusetts. Ancient fish apparatus used at Rockport. (1.) Old Stone Killick. Old Bait Chopper. Old Lantern.

**PERKINS AND SHURTLEFF,** Portland, Maine. 1 box of compre cod, 10 packages in case, 5 pounds each, with all large bones removed, compressed in a round shape, and ready for cooking. (26.)

**PHILLIPS, BARNET,** New York City. Essay on Prehistoric Fi hooks. (57.)

**PHOTO-ENGRAVING COMPANY,** A. R. Hart, President, 67 Pa Place, New York City. Photo-engravings of Fish from pen drawings.

**PICKERT, L., & CO.,** Boston, Massachusetts. Dry salted preparati (26.) Compressed Codfish, 5-pound paper packages. Smoked preparations. (26.) wood's English Boned Herring, in tin. Blackwood's Mount Desert Boneless Herring, in Finnan Haddies, 1-pound cans. Preparations in spices, vinegar, &c. (26.) Soused Mack Soused Brook Trout. Broiled Mackerel, Mustard Sauce. Broiled Mackerel, Tomato S Soused Brook Trout. Fresh Codfish. Fresh Mackerel. Fresh Lobster. Fresh Cl Clam Chowder. Fried Smelts. Fishermen's food in cans. (22.) Baked Beans, 3-p cans. New England Boiled Dinner, 3-pound cans. Samples of brands of boneless fish canned fish. (26.)

**PICKING, HENRY F.,** Commander, U.S.N., Naval Secretary, Li House Board, Washington, District of Columbia. Nickel-plated working model of Courtenay Automatic Whistling Buoy. (6.)


# LIFE BELTS AND VESTS.

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**ERCE, CAPT. EBEN,** New Bedford, Massachusetts. Bomb-lance for whales. (1.)

**KE, R. G.,** Middletown, Connecticut. Model of Spiral Fishway, show- economy of space and material, by spiral arrangement. (37.)

**TTER & WRIGHTINGTON,** Boston, Massachusetts. Dry salted tions. (26.) Smoked preparations. (26.) Boneless Herring, Lion and Unicorn in cans. Smoked Salmon, Lion and Unicorn brand, in cans. Smoked Halibut, Lion icorn brand, in cans. Pickle or brine-salted preparations. (26.) Canned salt Mackerel, nd Unicorn brand, 5-pound oval cans. Prize Mess Mackerel, 5-pound oval cans. light Mess Mackerel, 4-pound oval cans. Preparations in spices, vinegar, &c. (26.) Soused Mackerel in Mustard. Spiced Ocean Trout. Soused Herring. Herring in Sauce. Eels in Jelly. Mackerel in Tomato Sauce. Ocean Trout in Tomato Sauce. preparations in cans. Fresh Mackerel. Fresh Herring. Fresh Ocean Trout. Fresh Fresh Codfish. Minced Codfish. Fresh Lobsters. Clam Chowder. Codfish Chowder. Cod. Fishermen's food in cans. (22.) Baked Beans. Roast Beef. Roast Mutton. Turkey. Roast Chicken. Roast Veal. Boiled Dinner.

**TTS, EDWARD,** Philadelphia, Pennsylvania. Collection of Fresh- Sponges, in alcohol, and mounted for microscopic examination. (43.)

**OCTER BROTHERS,** Gloucester, Massachusetts. File of "Cape dvertiser." (60.) Publications relating to the Fisheries. (60.)

**TNAM, PROF. F. W.,** Cambridge, Massachusetts. Publications upon ology. (55.)

**INNIPIAC FERTILIZER COMPANY,** New London, Connecticut. s of Menhaden Guano. (29.) Dry Fish Scrap. Dry Ground Fish Guano. Fish and (ammoniated with fish). Superphosphate (ammoniated with fish).

**THBUN, RICHARD,** United States National Museum, Washington. tions upon Aquatic Invertebrates. (61.)

**U, DR. CHARLES,** U. S. National Museum, Washington. Publica- n prehistoric fishing. (57.)

**CHT, C.,** 183 Bowery, New York City. Foster's transparent Gimp (14-16.)

**CARDO, GEORGE,** Hackensack, New Jersey. Box for hatching the smelt. (35.)

**CHARDSON, NATHAN,** Gloucester, Massachusetts. Richardson nge Steerer. (6.) Steering-wheel, patented May 30, 1882.

**DGWAY REFRIGERATOR COMPANY (LIMITED),** Phila- , Pennyslvania. Model of Refrigerator. (33.)

**DGWAY, ROBERT,** U. S. National Museum, Washington. Publica- upon aquatic and fishing birds. (53.)

**LEY, PROF. C. V.,** Department of Agriculture, Washington. Types cts useful and injurious to fish and fishermen. (49.)

**BINSON, WM. S., & CO.,** New Haven, Connecticut. Exhibit of d kegs for packing oysters and fish. (33.)

**SENSTEIN BROTHERS,** 323 Greenwich Street, New York City. ations in spices, vinegar, &c. (26.) Spiced Sardines, Royal Brand. Mustard Sardines. d Sardines. Preparations in oil. (26.) Oil Sardines, Debois brand. Oil Sardines, Louis e brand. Oil Sardines, Alfred Elienne brand. Cooked preparations in cans. (26.) Lobsters, Royal brand, Eastport Packing Company.

**SSELL, ALBERT & SONS,** Newburyport, Massachusetts. Pump on fishing vessels. (6.)

**SSELL MILLS COMPANY,** Plymouth, Massachusetts, N. Boynton Agents, Boston, Massachusetts. Samples of sail canvas. (5.)

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**BESTE GEWASTE TAFFEN: KLEEDINGSTUKKEN.**
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**RUSSIA CEMENT COMPANY,** Gloucester, Massachusetts. Theo Eckhardt, General Agent, 32 Aldermanbury, London, E.C., and 38 Neue Friedrichstra Berlin. Exhibit of glue made from fish skins and materials used in its manufacture, a articles in the preparation of which fish-glue is used. (29.)

**RYDER, JOHN A.,** U. S. Fish Commission, Washington. Publicati upon the embryology of fishes and microscopic sections and photographs illustrative of th same. (36 & 55.)

**SCAMMON, CHARLES M., CAPTAIN,** U. S. Revenue Marine. Th volume on Marine Mammals, together with account of the American whale-fishery. (

**SCHMIDT, S., & BRO.,** New York City. Smoked preparations. (2 Smoked Eels; Smoked Salmon; Smoked Sturgeon; Smoked Smelts; Smoked Herring; Herring. Pickle or brine salted preparations. (27.) Caviare (Sturgeon roe). Fried in vinegar.

**SCRIBNER'S SONS, CHARLES,** New York City. Game Fishes the United States. (55, 57, 61.) A series of twenty magnificent paintings of fishes scenery, by S. A. Kilbourne, with text by G. Browne Goode, assistant director United States National Museum, and assistant in the United States Fish Commission; 10 parts in wrapp not stitched, large folio, 1879–1881. Also a map, showing by means of coloured lines geographical distribution of the game fishes of Eastern North America, compiled sketches by G. Brown Goode; and many engravings.

**SEA WORLD PUBLISHING COMPANY,** W. B. Hopson, manag and editor, Baltimore, Maryland. File of "The Sea World and Packer's Journal."

**SELLMAN, HENRY,** Camden, Maine. (Union Fish Company.) M of Sardine Factory. (25.)

**SEWELL, DAY & CO.,** Boston, Massachusetts. Samples of Cordage on fishing vessels. (5.)

**SHAW, B. F.,** Anamosa, Iowa. Model of step and pool Fishway in arrangement. (67.)

**SHINDLER, A. ZENO,** U. S. National Museum, Washington. Pain of tortoise, snake, and fish from plaster casts. Three specimens. (The entire colle reptiles and fishes in the collective exhibit of the United States was painted by Mr. Sh

**SHIPLEY, A. B., & SONS,** Philadelphia, Pennsylvania. Fishing-r (14–16.) Two Six-strip split Bamboo rods, one $20, another $30. Split Bamboo rod in case. Bethabara wood, (i.) 10-feet pole, $16.50. (ii.) Pole 5½ ounces, $10.50. pole, $16.50. Fishing-reels. (14–16.) 70-yard Balance sliding slick reel. 250-yard mount click reel. 300-yard Balance handle, steel pivots, &c. Waterproof fly-line. Brails, snoods, cat-fish nippers, and other articles used by anglers. (14–17.)

**SIGSBEE, COMMANDER CHARLES D.,** U. S. Navy, Washing Apparatus employed in deep-sea research in the work of the United States Coast Survey.

**SMILEY, C. W.,** United States Fish Commission, Washington. Publi tions relating to fish and fishermen. (60.)

**SIMMS, JAMES M.,** Gloucester, Massachusetts. Gang of stand rigging for fishing schooners. (5.)

**SMILLIE, T. W.,** Photographer, U. S. National Museum, Washing One screen of photographs of fishes and illustrative of the fisheries. (51.) (The entire co of photographs in the collective exhibit of the United States was made by Mr. Smillie.)

**SMITH, EVERETT,** Portland, Maine. Model of inclined plane fish-way. (37.)

**SMITHSONIAN INSTITUTION,** Washington. Spencer F. Ba Secretary. Publications relating to the Natural History of the waters. (53–61.)

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Are invited to inspect the
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**NOW, B. S., & CO.,** Boston, Massachusetts. Boneless Codfish. (26.)

**OLUBLE PACIFIC GUANO COMPANY,** Wood's Holl, Massa-etts. Series of preparations illustrating the manufacture of soluble Pacific Guano. (29.) e Menhaden Scrap; Dried and Ground Menhaden Scrap; Muriate of Potash; Nitrate of Crude South Carolina Phosphate; Crushed South Carolina Phosphate; Ground South ina Phosphate; Sicily Sulphur; Stassfurth Kainite; Soluble Pacific Guano, unscreened; le Pacific Guano, screened.

**TANLEY, HENRY O.,** Dixfield, Maine. Pencil sketch on birch-bark Rangeley Trout caught by Mr. Stanley, October 10, 1877; weight 9½ lbs. (57.)

**TILLWELL, E. M.,** Bangor, Maine. Can for transportation of young fish ump for aerating the water. (35.) Painting on birch-bark of Grand Lake Stream Trout. (51.)

**TINEMETZ, B. H.,** 1237 Pennsylvania Avenue, Washington. Collective y of skins of beaver, otter, musk, and musquats, raw, plucked, and dressed. (32.)

**TONE, LIVINGSTON,** Charlestown, New Hampshire. Series of eggs oung of the California Salmon, showing the daily growth from the newly-impregnated o the young fish several weeks old. (16.) Apparatus used in hatching eggs of the us species of Salmonidæ; also box for rearing young Salmon. (16.)

**WAN, JAMES G.,** Port Townsend, Washington Territory. Publications ng to the Indian fisheries of the North-west coast. (Most of the fishery collection from orth-west coast in the fisheries exhibit was obtained through Mr. Swan.)

**ANNER, LIEUT. Z. L.,** U.S.N., U.S. Steamer "Albatross." Deep-ounding Machine. (40.)

**ARR & WONSON,** Gloucester, Massachusetts. Patent Copper Paint, on bottoms of fishing vessels. (6.)

**AYLOR, THOMAS,** New Berne, North Carolina. Can for the trans-ion of fish ova. (35.)

**AYLOR, WILLIAM,** Portland, Maine. Improved sword-fish lily iron. (1.)

**HAXTER, S., & SON,** Boston, Massachusetts. Exhibit of Eldridge's ts and Coast Pilot. (6.)

**HE GEORGE W. MILES COMPANY,** Milford, Connecticut. ples of Menhaden; Menhaden Oil and Guano. (29.)

**IFFANY & CO.,** New York City and Paris. Exhibit of articles made ligator Skin. (32.) Travelling-bags in great variety, and filled with articles for ladies gentlemen. Steamer bags, tourists' bags, railroad bags, pic-nic bags, dress suit bags, bags, shopping bags, brief bags, belt bags for ladies, card cases, letter cases, porte-nnies, pocket books, bill books, visiting books and cases, blotters, railroad ticket cases, cription books, memorandum books, nail-set cases, dressing cases, scissor cases, hair-brush s, cigarette cases, cigar cases, photograph cases (pocket), razor cases, note cases, jewelry s, comb cases, work cases, writing cases, postage-stamp cases, cigar boxes, jewel boxes, kerchief boxes, glove boxes, match boxes, photograph frames, photograph screens, coin hes, eye-glass pouches, papeteries, music rolls, shawl straps, inkstands, belts for ladies, collars, portable mirrors, paper racks, gentlemen's key belts.

**ODD, H. L.,** draughtsman, U. S. Fish Commission, Washington. Draw-of fishes for photo-engraving process. (51.)

**OWER, A. J.,** Boston, Massachusetts. Oiled clothing worn by fisher-. (21.) *a. Double goods, yellow. Fish brand.* 1. Officer's Long Coat, with inside sleeve, er button-holes, patched elbow, epaulet on shoulder, &c. 2. Long Coat. Patched ws, inside sleeves, and epaulets. 3. Jacket. 4. Fishermen's Apron Pants. 5. Seaman's ng Pants. 6. Frock or Half Coat. 7. Petticoat Barvell. 8. Barvell or Apron. 9. Sleeves. *Double goods, black. Fish brand.* 10. Long Coat. 11. Jacket. 12. Fishermen's Apron ts. 13. String Pants. 14. Petticoat Barvell. 15. Common Barvell. 16. Sleeves. *iled Hats.* 17. "Cape Ann" or Sou'wester. 18. Soft yellow. 19. Soft Black. 20. Yellow black Squam. 21. Miner's (with leather).

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**UNITED STATES ALBUMEN MANUFACTURING COMPA**
Osterville, Massachusetts. Uno. H. Hillman, Superintendent. Albumen made from fish ova.

**UNITED STATES BEACON LIGHT AND SIGNAL COMPA**
J. M. Foster, President, Philadelphia, Pennsylvania. Exhibit of beacons and signals.

**UNITED STATES CENSUS OFFICE; TENTH CENSUS THE UNITED STATES.** C. W. Seaton, Superintendent, Washington. Sta relating to the Fisheries. (60.) Reports and maps illustrating the condition of the U States in 1880.

**UNITED STATES PATENT OFFICE.** Hon. Edgar M. Marble, missioner. List of patents relating to the fisheries complete to 1883. (60.)

**UNITED STATES NATIONAL MUSEUM,** Spencer F. Director, Washington. Proceedings and bulletins containing numerous papers relating natural history of fish and other aquatic animals. (60.) The collections of the Na Museum have been extensively drawn upon in the preparation of the collective exhi the United States, in accordance with the provisions of the law authorizing the part tion of the United States in this Exhibition.

**U.S. BUREAU OF NAVIGATION—HYDROGRAPHIC OFF**
Com. J. C. P. de Krafft, Hydrographer. Charts of the Atlantic and Pacific Coasts America. (6.)

**U.S. NAUTICAL ALMANAC OFFICE,** Washington. Simon New Supt. Nautical Almanacs. (6.) American Ephemeris. (6.)

**U.S. BUREAU OF STATISTICS,** Washington. Joseph Nimmo, Jr. Supt. Statistics of tonnage and exports and imports.

**UNITED STATES LIFE-SAVING SERVICE,** Sumner I. Kim Superintendent. Exhibit of apparatus and publications used by the service. (9.) A Boats. I. New Jersey Lifeboat for sandy beaches. II. The Long Island Lifeboat for beaches. III. Massuchusetts Lifeboat for rocky and shingly beaches. IV. The Dobbin boat, self-righting, self-bailing, and self-ballasting, used at stations adjacent to bar where there is a sheltered place for landing. B.—The American Life Car, about 12 ft Will transport from a wreck to the shore at each trip six people, protecting them exposure to the weather. C.—Beach Apparatus Cart. Used at all stations of the Life Service, and loaded with all apparatus for making connections from shore to wreck, gun, hawser, whips, breeches buoy, and shot-line. The gear used with the apparatus serviceable with either breeches buoy or life-car. D.—Life-Saving Apparatus. I. Mer Rubber Suit. II. Life-Preserving Apparatus. E.—Old and new types of beach used in making connections with wrecks.* F.—The illustrations of the patrol system cluding patrol checks and other outfits. G.—Shot lines and other cordage used in the H.—Drawings and specifications of Life Boat Stations at various points on the coasts Atlantic, Pacific, and Great Lakes.† I.—Medicine chest and other appliances for rescuing the wrecked. K.—Papers and documents used in the service or explanatory of its L.—A collection of paintings, illustrating the operations of the service; exhibited Century Company of New York City.

**UNITED STATES COAST AND GEODETIC SURVEY,** Wash ton. J. E. Hilgard, Superintendent. Collection of about one hundred and twelve published by the Survey, being charts of the Atlantic and Pacific coasts of North America Divisions, A, B, and 14 of the Atlantic Coast Pilot. (6.) Apparatus for the scientific gation of the waters—densimeter and salinometer—invented by Professor J. E. Hilgard.

**U.S. LIGHT-HOUSE BOARD,** Vice-Admiral, S. C. Rowan, U.S. Chairman, Washington. Map showing the positions of the Life-Saving and Light Stations the United States. (7.) Charts of the following Light-House Districts: First, second

* This gun was the first ever fired in the American Life-Saving Service, and was instrumental in saving lives from the English ship "Ayreshire."

† The location of these stations is marked with green circles on the large map furnished by the Department.

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iding Lake Champlain), fourth, fifth, sixth, seventh, eighth, eleventh, twelfth, and enth. Reports of the Light-House Board for the years 1872, 1873, 1874, 1875, 1876, 1878, 1879, 1880, 1881, and 1882. Drawings and Specifications for Light-Houses, ons, Buoys, Light-Vessels, and Light-House and Buoy Tenders. 6 vols. Pictures of e-Houses, Tenders, Light-Vessels, &c.: First-order Light-House on Thatcher's Island, Ann, sea coast of Massachusetts. (Photo.) Second-order Light-House on Minot's e, sea coast of Massachussets. (Oil painting.) Fourth-order Light-House on Southwest e, Long Island Sound, Connecticut. (Water colour). Day or Unlighted Beacon on Flower Reef, Long Island Sound, Connecticut. Screw-pile Light-House at Cedar , Potomac River, Virginia. (Photo.) Screw-pile Light-House on Thimble Shoal, ton Roads, Virginia. (Indian ink). First-order Light-House on Cape Henry, nce to Chesapeake Bay, Virginia. (Water colour.) Second-order Light-House on Hunt-sland, sea coast of South Carolina, entrance to Saint Helena Sound. (Photo.) Rear n of Paris Island Range. Guide into Port Royal Sound, South Carolina. (Water .) First-order Light-House at Saint Augustine, sea coast of Florida. (Photo.) First-Light-House on Fowey Rocks, sea coast of Florida. (Water colour.) Fourth-order -House at entrance to Calcasieu River, Gulf Coast of Louisiana. (Photo.) Western Stake Light. (Water colour.) Third-order Light-House at Cleveland, Ohio. (Water .) Second-order Light-House at Grosse Pointe, Illinois. (Photo.) Second-order Light- on Stannard's Rock, Lake Superior, Michigan. (Water colour.) First-order Light- at Piedras Blancas, sea coast of California. (Indian ink.) First-order Light-House eon Point, sea coast of California. (2 photos.) Fourth-order Light-House on Mare entrance to Straits of Karquines, California. (Indian ink and Sepia.) First-order House at Point Reyes, sea coast of California. (Photo.) First-class Light Vessel with Fog Whistle. (Photo.) Light-House Tender "Dahlia." (Indian ink.) Light-House "Manzitana." (Water colour.) Models: Second-order Light-House on Minot's Ledge, st of Massachussetts. Light Vessel No. 40 on Five Fathom Bank, entrance to Delaware First order Light-House on Fowey Rocks, sea coast of Florida. Scale ¾ inch to 1 foot. en of Coral from Fowey Rocks, Florida. First-order Light-House on Sand Key (near est), Florida. Scale, ½ to 1 foot. Second-order Light-House on Spectacle Reef, Lake Michigan. Crib used in the construction of Spectacle Reef Light-House. Coffee Dam preparing the reef and laying the lower courses of Spectacle Reef Light-House. 's model of Light-Vessel. Courtenay Automatic Whistling Buoy.

**ITED STATES ARMY SIGNAL SERVICE.** W. B. Hazen, ier and Brevet Major-General, Chief Signal Officer, U.S.A. (This Exhibit will be n the United States Department.) Instruments used in the meteorological service and tem of weather forcasts and storm signals. (6.) List of instruments; 2 barometers, mum thermometers, 2 minimum thermometers, 3 exposed thermometers, with supports , muslin and wicking for wet bulb, 2 water thermometers, 1 water thermometer case rd, 2 anemometers, one for interior and one for exterior, 1 self-register, double, 1 baro-self-registering, Eccard's (transmitter and recorder), 1 wind vane, large, with attachment e (one used at Paris), 3 rain-gauges—one copper, one galvanized iron, and one small signal service telescope, 1 signal service telescope holder, 1 signal service marine glass, oxes, 2 phones and 2 transmitters, Eccard's, 1 anemometer Post, 4½ feet high, 1 signal red, large, 1 signal lantern, white, large, 100 feet cautionary signal halyards, 1 ary signal indicator, 1 wreck knapsack, 1 A tent, 1 folding table, 2 folding chairs, 2 nders, 2 pliers, pairs, 1 dash lantern, 1 cable box for coast line, 1 testing box-line, 1 , Signal Service, 1 banner, silk, embroidered, Signal Service, U.S.A., 1 set of flags tional, 1 set of flags, life-saving, 2 flags, 8 feet, red cautionary, 2 flags, 6 feet, red, ary, 2 flags, 8 feet, white, cautionary, 2 flags, 6 feet, white, cautionary, 2 signal kits, te, with 2-feet flags, 1 circuit map, framed, 1 map, showing cautionary display stations, 1 map, enlarged, sea-coast line, framed, 1 map, large, weather, 1 set Annual Reports, bound, 1 set International Bulletins, bound, 1 set Monthly Weather Reviews, bound, aily Bulletins, &c., bound, 1 set tri-daily weather maps, bound, large, 1 set Professional 1 set Signal Service Notes, 6 cipher books, 6 sets cipher cards, 6 Instructions to ers, 12 Instructions to Voluntary Observers, 1 Signal Service Manual, 6 Manuals, y Telegraph, latest edition, and Instructions for constructing Military Telegraph Lines,

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1 Army Regulations, 1 set telescope blanks (filled out) for transmitting cau. sig. [illegible] showing method of ordering signals *up* or *down*, with explanatory messages, giving [illegible] of storm. Manifold forms and carbon paper—1 set of manifold forms, 107, filled out; 1 [illegible] manifold Press Reports, filled out; 1 set manifold of River Bulletins, filled out.

**VAN ALTENA & SHELTUS**, Milwaukee, Wisconsin. Samples of "[illegible] Connecting Sinker or Fish-hook Holder." (14–16.)

**VERRILL, PROFESSOR A. E.**, Yale College, New Haven, Connecticut. Publications upon marine invertebrates and deep-sea research. (61.)

**VOSS, ADOLPH**, Gloucester, Massachusetts. Bait Mill. (6.) [illegible] crotch Supporter. (6.) (See Collective exhibit).

**VOSS, O. C.**, Gloucester, Massachusetts. Snug-stow anchor. (6.)

**WHITE, DR. C. A.**, U.S. Geological Survey, Washington. Monograph [illegible] the land and fresh-water fossil molluscs of North America, containing essay upon the [illegible] tion of fresh-water molluscs and fishes from marine forms. (56.)

**WILCOX, W. A.**, Secretary Boston Fish Bureau, Boston, Massachusetts. Exhibits showing methods of reporting the statistics of the fish markets of New [illegible] (60.) Reports of the Boston Fish Bureau. (60.) These reports are issued daily (during the busy fishing season several times a day); also, weekly, monthly, and annually. They [illegible] receipts of all fish arriving in Boston, both foreign, domestic, and from fishing [illegible] Receipts of fish at all the leading out-posts are daily reported; movements of the fish [illegible] fishing fleets, from day to day; success and prospects of the catch; market quotations of [illegible] are daily reported by telegraph from all important localities, with reports from special correspondents at all leading ports in the United States and British Provinces of all [illegible] of interest in connection with the fishing industry; also, weekly statistics and comparisons of receipts, catch, prices, &c., with former years.—W. A. Wilcox.

**WILCOX, CRITTENDEN & CO.**, Middletown, Connecticut. [illegible] and vessel fittings, old and new styles, in great variety. (6.)

**WILLETS, JOSEPH**, Skaneateles, New York. Angler's Rack for [illegible] ing blankets, guns, &c. (19.) Angler's Home-made creel. (19.)

**WING, J. & W. R.**, New Bedford, Massachusetts. Slab of baleen whalebone from Bowhead whale, *Balæna mysticetus*, taken in Pacific Arctic Ocean by [illegible] "Fleetwing," in May, 1882. (32.)

**WINSLOW, LIEUT. FRANCIS**, U.S. Navy, Washington. Publications, charts, and photographs illustrating the natural history of the oyster and the oyster-[illegible] (35 and 61.)

**WOLFF AND RIESING**, Eastport, Maine. Preparations in oil. [illegible] Oil Sardines. Preparations in spices, vinegar, &c. (26.) Mustard Sardines. Marinade [illegible]

**WOLTZ, GEORGE**, Washington. Model of Potomac shad-lighter.

**WONSON, EVERETT P.**, Gloucester, Massachusetts. Exhibits [illegible] stuffed fishes, prepared by Davidson's method of ichthyotaxidermy. (51.)

**WOOD, REUBEN**, Syracuse, New York. The Reuben Wood (1) [illegible] fly. (15.) (2) Bass-fly. (15.)

**WOOD, LIEUT.**, U.S. Navy, U.S. steamer "Fish Hawk." Self-[illegible] apparatus for lowering small boats. (9.)

**WOODBURY MILLS**, Baltimore, Maryland. Samples of canvas used [illegible] fishing vessels. (5.)

**WORREL, JAMES**, Columbia, Pennsylvania. Model of sluice fish-[illegible] (37.)

**WRIGHT, ISAAC H.**, Baltimore, Maryland. Submerged hatching [illegible] with float for suspending it at any depth below the surface. (35.)

**WROTEN, WILLIAM G.**, Maryland. Bucket for transporting [illegible] hatching fish ova. (35,)

**ANDERSON, ABBOTT, & ANDERSON'S**
**FISHING STOCKINGS**
**ARE GUARANTEED ABSOLUTELY WATERPROOF.**
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## CONCORDANCE TO THE OFFICIAL CLASSIFICATION,

FOR THE USE OF THE JURIES.

collective exhibit of the United States are included many articles which are labelled names of the persons from whom they were obtained, these are not, as a rule, entered etition.

e following list are included the names of all exhibitors who will be permitted to awards or special mention from the juries.

rtists and preparators by whom the pictures, photographs, casts, stuffed specimens, els, &c., have been prepared, may be classed as exhibitors. A list of their names is the beginning of the special catalogue of this collection.

### CLASS I.—SECTION I.

### FISHING.

[SEA FISHING.]

DIVISION I.

**r of every description and of all nations used in trawl, herring, ine, hand line, and every other mode or system of fishing, ling all nets, lines, hooks, harpoons, tackle, &c., employed in me.**

d States Commission of Fish and Fisheries. Collective Exhibit. Groups, 47, 48, 50, 53, 59, 60, 61, 62, 63, 64, 67, 68, 69, 70, 72, 73, 74, 75, 78, 80, 81, 32, 83, 115, 116, 117, , 121.

**LEN, F. S.**, New Bedford, Massachusetts.
**AND, JAMES A.**, New Bedford, Massachusetts.
**OWN, JAMES TEMPLE**, United States National Museum, Washing-

**LE, LUTHER**, New Bedford, Massachusetts.
**GERS, S.**, New Bedford, Massachusetts.
**SON, H. W.**, New Bedford, Massachusetts.
**RCHANT, GEORGE, JUN.**, Gloucester, Massachusetts.
**W BEDFORD CORDAGE COMPANY**, New Bedford, Massa-
s.
**KERSON & BAXTER**, Boston, Massachusetts.
**RSONS, CAPT. WILLIAM B.**, Rockport, Massachusetts.
**RCE, CAPTAIN EBEN**, New Bedford, Massachusetts.
**YLOR, WILLIAM**, Portland, Maine.

DIVISION II.

**r dredges, crab, lobster, prawn, &c., pots, and other appliances for catching fish of this description.**

d States Commission of Fish and Fisheries. Collective Exhibit. Groups 49, 71, 73, 76, 83.

**YWOOD, WILLIAM P.**, West Creek, Ocean County, New York.

THE ROYAL

FISHING & YACHTING BOOTS FOR LADIES,

*AS MADE EXPRESSLY FOR HER MAJESTY THE QUEEN.*

ANDERSON, ABBOTT, & ANDERSON, 37, Queen Victoria Street, E.C.

DIVISION III.

**Fishing craft of all nations; models and representations of the sa**

(i.) Steam fishing vessels and steam carriers.

United States Commission of Fish and Fisheries. Collective Exhibit. Groups 8 156, 157.

DIVISION IV.

(ii.) Fishing vessels and boats other than steam vessels.

United States Commission of Fish and Fisheries. Collective Exhibit. Groups 8 87, 88, 98, 114.

**BARTLETT, I. H., & SONS**, New Bedford, Massachusetts.
**COOK, H. S. & CO.**, Provincetown, Massachusetts.
**IRVING, THOMAS A.**, Gloucester, Massachusetts.

DIVISION V.

**Ropes and canvas suitable to fishing vessels.**

United States Commission of Fish and Fisheries. Collective Exhibit. Groups 88,

**DONNELL, J. T., & CO.**, Bath, Maine.
**NELSEN, CHRESTEN**, Gloucester, Massachusetts.
**OLD COLONY MILLS**, Plymouth, Massachusetts.
**RUSSELL MILLS COMPANY**, Plymouth, Massachusetts.
**SEWELL, DAY & CO.**, Boston, Massachusetts.
**SIMMS, JAMES M.**, Gloucester, Massachusetts.
**WOODBURY MILLS**, Baltimore, Maryland.

DIVISION VI.

**Steam capstans, compasses, barometers, telescopes, lights, fog horns, systems of signalling at night for fishing fleets and electric lights, luminous paint, and other equipment of fishing charts for fishermen.**

United States Commission of Fish and Fisheries. Collective Exhibit. Groups 92, 93, 94, 95, 96, 97, 99.

**UNITED STATES NAVY, HYDROGRAPHIC OFFICE.**
**UNITED STATES NAVY, NAUTICAL ALMANAC OFFICE**
**UNITED STATES COAST AND GEODETIC SURVEY.**
**ADAMS, MAYHEW**, Chilmark, Massachusetts.
**AMERICAN SHIP WINDLASS COMPANY**, Providence, Island.
**ATWOOD BROS.**, Clayton, New York.
**BAGNALL & LOUD**, Boston, Massachusetts.
**BLISS, JOHN, & CO.**, New York City.
**CAPE ANN ANCHOR WORKS**, Gloucester, Massachusetts.
**CARPENTER, CHARLES**, Kelley's Island, Ohio.
**CLARK, JAMES B.**, Chester, Connecticut.
**COLLINS, JOSEPH W.**, Gloucester, Massachusetts.
**DAVIS & CO.**, Gloucester, Massachusetts.

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**No Household should be without them.**
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EPH, DAVIS, & CO., Cincinnati and London.
E, E. W., & CO., New York City.
ING, COMMANDER HENRY T., United States Navy.
HARDSON, NATHAN, Gloucester, Massachusetts.
SELL, ALBERT, & SONS, Newburyport, Massachusetts.
R & WONSON, Gloucester, Massachusetts.
XTER, S., & SONS, Boston, Massachusetts.
S, ADOLF, Gloucester, Massachusetts.
S, O. C., Gloucester, Massachusetts.
COX, CRITTENDEN & CO., Middletown, Connecticut.
D, LIEUTENANT, United States Navy, U.S. Steamer, "Fish

DIVISION VII.

Models of harbours, piers, and slips for fishing purposes.

States Commission of Fish and Fisheries. Collective Exhibit. Groups 77, 112, 124.

GINS & GIFFORD, Gloucester, Massachusetts.

DIVISION VIII.

g tackle and netting in different stages of preparation, and machinery used for working up the raw material.

States Commission of Fish and Fisheries. Collective Exhibit. Group 67.

RICAN NET AND TWINE COMPANY.
D, H. & G. W., Boston, Massachusetts.

DIVISION IX.

ats, their equipment, and life-saving apparatus of every description.

States Commission of Fish and Fisheries. Collective Exhibit. Groups 86, 97.

EN, FREDERICK S., Cuttyhunk, Massachusetts.
TURY COMPANY, New York City.
BINS, D. P., Buffalo, New York.
GINS & GIFFORD, Gloucester, Massachusetts.
MES, MARSHALL H., Philadelphia, Pennsylvania.
E, LIEUT. D. A., U.S. Army.
SACHUSETTS HUMANE SOCIETY, Boston.
ERMOOR, H. D., & SON, New York City.
ARMY SIGNAL SERVICE.
TREASURY LIFE-SAVING SERVICE.
TED STATES BEACON LIGHT AND SIGNAL COMPANY, hia.
D, LIEUT., U.S.N., Washington.

DIVISION X.

nces and methods for breaking the force of the sea at the entrance of harbours and elsewhere.

States Fish Commission Photography.

NDERSON, ABBOTT, & ANDERSON,
MANUFACTURERS OF EVERY DESCRIPTION OF
INDIA-RUBBER
or Mechanical, Scientific, and Domestic purposes; also Manu-
cturers of Leather and Canvas Hose, Leather, India-Rubber, and
their Patent Cerofilum Belting, Sheet Rubber, Tubing, &c.

DIVISION XI.

**Methods of communication from the shore to light-ships an fishing fleets by submarine cables.**

(No display.)

DIVISION XII.

**Methods of protecting submarine cables from injury by fishi operations. (Illustrated by models and drawings.)**

(No display.)

SECTION II.

FRESH-WATER FISHING.

DIVISION XIII.

**Salmon nets and fixed appliances for catching salmonidæ in a their varieties.**

United States Commission of Fish and Fisheries. Collective Exhibit. Groups 49, 67, 69, 70, 72.

DIVISION XIV.

**Salmon rods, reels, lines, artificial flies and baits, gaffs, spe creels, &c.**

*See* Division XVI.)

DIVISION XV.

**Trout rods, reels, landing nets, lines, artificial flies, ba baskets, bags, &c.**

(*See* Division XVI.)

DIVISION XVI.

**Pike, barbel, and other coarse fish-rods, reels, and tac artificial spinning baits, &c.**

United States Commission of Fish and Fisheries. Collective Exhibit. Groups 47, 48, 53, 54, 55, 58, 59, 61, 62, 65, 66, 80.

**COMSTOCK, HARRY,** Fulton, New York.
**CONROY & BISSETT,** New York City.
**HILL, L. S., & CO.,** Grand Rapids, Michigan.
**HOLBERTON, WAKEMAN,** New York City.
**LOOMIS, PLUMB & CO.,** Syracuse, New York.
**MANN, JOHN, & CO.,** Syracuse, New York.
**MILAM, B. C.,** Frankfort, Kentucky.
**MILLS, WILLIAM, & SON,** New York City.
**NICHOLS, B. F.,** Boston, Massachusetts.
**RECHT, C.,** New York City.
**SHIPLEY, A. B., & SONS,** Philadelphia.
**SWAN, JAMES G.,** Port Townsend, Oregon.

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**CANNOT BE EXCELLED.**
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**LTENA & SCHELTUS, VAN,** Milwaukee, Wisconsin.
**OOD, REUBEN,** Syracuse, New York.

DIVISION XVII.

**ps, nets, bucks, wheels, and all kinds of apparatus for catching eels, lampreys, &c.**

ited States Commission of Fish and Fisheries. Collective Exhibit. Groups 48, 57, 70, 5, 76.

DIVISION XVIII.

**Hooks, &c.**

ited States Commission of Fish and Fisheries. Collective Exhibit. Groups 50, 51, 52, 4, 57.

**-REEN, SETH,** Rochester, New York.

DIVISION XIX.

**Anglers' apparel of every description.**

ited States Commission of Fish and Fisheries. Collective Exhibit. Groups 103, 107.

**ERGUSON, ALBERT,** New York City.
**ILLETT, JOSEPH C.,** Skaneateles, New York.

DIVISION XX.

**ts, punts, cobles, collapsible, portable, &c., in models or otherwise.**

ited States Commission of Fish and Fisheries. Collective Exhibit. Groups 86, 87, 88, 98.

**OLMES, FRANK,** Chagrin Falls, Ohio.
**GOOD, W. A.,** Battle Creek, Michigan.

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CLASS II.

ECONOMIC CONDITION OF FISHERMEN.

DIVISION XXI.

**Apparel and personal equipment.**

ited States Commission of Fish and Fisheries. Collective Exhibit. Groups 100, 101, 109, 110.

**ERCHANT, GEORGE, JUN.,** Gloucester, Massachusetts.
**OWER, A. J., & CO.,** Boston, Massachusetts.

DIVISION XXII.

**Food and medicine.**

ited States Commission of Fish and Fisheries. Collective Exhibit. Groups 104, 105.

**UTTRICK, J. T.,** New Bedford, Massachusetts.
**EWIS, W. K., & BROTHERS,** Boston, Massachusetts.
**AYO, HENRY, & CO.,** Boston, Massachusetts.
**CKERT, L., & CO.,** Boston, Massachusetts.
**OTTER & WRIGHTINGTON,** Boston, Massachusetts.

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SEULS FABRICANTS DES CÉLÈBRES

**VÊTEMENTS IMPERMÉABLES "LEVE ANTIPLUVIUM,"**

Adaptés à tous les climats,

en guise d'Habits et de Guêtres imperméables pour la Pêche; le plus léger t sau du Monde.

### Division XXIII.
### Models and plans of dwellings.

United States Commission of Fish and Fisheries. Collective Exhibit. Groups 106, 107.

### Division XXIV.
### Contracts of partnerships; insurances of, life, boats, gear, &c. benefit societies.

United States Commission of Fish and Fisheries. Collective Exhibit. Group 108.

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## CLASS III.
## COMMERCIAL AND ECONOMIC.

### Division XXV.
### Preparation, preservation, and utilization of fish.

(*a*) For edible purposes—

i. Models of fish-curing establishments. Methods of, and models and other representations of any appliances for, drying, curing, salting, smoking, tinning, cooking, &c.

United States Commission of Fish and Fisheries. Collective Exhibit. Groups 79, 124, 125, 126, 127, 128, 129.

**ATWATER, PROF. W. O.**, Middletown, Connecticut.
**SELLMAN, HENRY**, Camden, Maine.

### Division XXVI.

ii. Fish dried, smoked, cured, salted, tinned, or otherwise prepared for food.

United States Commission of Fish and Fisheries. Collective Exhibit. Groups 130, 131, 132, 133, 134, 135, 136.

**ALDEN, CHARLES**, Gloucester, Massachusetts.
**AMS, MAX**, New York.
**ALBANY BEEF PACKING COMPANY**, New York City.
**BAILEY, ARTHUR H., & CO.**, Boston, Massachusetts.
**BEARDSLEY'S, J. W., SONS**, New York City.
**BOOTH, A.**, Baltimore, Chicago, and Astoria.
**BURNHAM & MORRILL**, Portland, Maine.
**CUTTING PACKING COMPANY**, San Francisco.
**HINE & CO.**, New York City.
**LEWIS, W. K., & BROTHERS**, Boston, Massachusetts.
**McMENAMIN & CO.**, Hampton, Virginia.
**MAYO, HENRY, & CO.**, Boston, Massachusetts.
**MEGLER, J. G., & Co.**, Brookfield, Wahkiakum Co., Washington Territory.
**OREGON PACKING COMPANY** (J. W. & V. Cook), Portland, Oregon.
**PERKINS & SHURTLEFF**, Portland, Maine.
**PICKERT, L., & CO.**, Boston, Massachusetts.

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**ANDERSON, ABBOTT, & ANDERSON,**
**Celebrated for their OILSKINS in all the Fishing Districts of Canada, Newfoundland, Sweden, Norway, Holland, France, and the whole of the British Isles**

**POTTER & WRIGHTINGTON**, Boston, Massachusetts.
**ROSENSTEIN BROTHERS**, New York City.
**SCHMIDT, S., & CO.**, New York City.
**SNOW, B. S., & CO.**, Boston, Massachusetts.
**WOLFF & RIESING**, Eastport, Maine.

DIVISION XXVII.

iii. All products prepared from fish, such as oils, roes, isinglass, &c.

United States Commission of Fish and Fisheries. Collective Exhibit. Groups 147, 149.

**DODD, A. W., & CO.**, Gloucester, Massachusetts.
**UNITED STATES ALBUMEN MANUFACTURING COMPANY**, Sterville, Massachusetts.

DIVISION XXVIII.

iv. Antiseptics suitable for preserving fish for food.

United States Commission of Fish and Fisheries. Collective Exhibit. Group 127.

DIVISION XXIX.

(*b*) For other than edible purposes—

i. Oils, manures, and other products prepared from fish.

United States Commission of Fish and Fisheries. Collective Exhibit. Groups 149, 152.

**ABBE, W. A.**, New Bedford, Massachusetts.
**ALBANY BEEF PACKING COMPANY.**
**DODD, A. W., & CO.**, Gloucester, Massachusetts.
**DUNAN, WINFIELD S.**, Baltimore, Maryland.
**GEORGE W. MILES COMPANY, THE**, Milford, Connecticut.
**GLOUCESTER ISINGLASS AND GLUE COMPANY**, Gloucester, Massachusetts.
**QUINNIPIAC FERTILIZER COMPANY**, New London, Connecticut.
**RUSSIA CEMENT COMPANY**, Gloucester, Massachusetts.
**SOLUBLE PACIFIC GUANO COMPANY**, Wood's Holl, Massachusetts.

DIVISION XXX.

ii. Methods of, and models, and other representations of appliances for preparing oils and manures from fish.

United States Commission of Fish and Fisheries. Collective Exhibit. Groups 111, 113, 119, 124, 125, 128.

DIVISION XXXI.

iii. Sea and fresh-water pearl shells: mother-of-pearl manufactured; pearls sorted.

United States Commission of Fish and Fisheries. Collective Exhibit. Groups 144, 145.

DIVISION XXXII.

iv. Preparation and application of sponges, corals, pearls, shells, and all parts and products of aquatic animals, &c., to purposes useful and ornamental, with specimens.

United States Commission of Fish and Fisheries. Collective Exhibit. Groups 137, 138, 139, 140, 141, 142, 143, 146.

**ALASKA COMMERCIAL COMPANY.**
**BARTLETT, I. H., & SONS**, New Bedford, Massachusetts.
**CHESTER, H. C.**, Noank, Connecticut.

**ANDERSON, ABBOTT, & ANDERSON'S**
**PONCHO WATERPROOF**
Affords absolute protection when Riding. Much used in Brazil and other Tropical Countries. Also makes an excellent Ground Sheet.
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**MAHRENHOLZ, H. J.**, New York City.
**STINEMETZ, B. H.**, Washington.
**TIFFANY & CO.**, New York City and Paris.
**WING, J. & W. R.**, New Bedford, Massachusetts.

DIVISION XXXIII.

**Transport and sale of fish.**

(*a*) Appliances for carrying fish and for preserving fish during transport or otherwise and models of the same.

United States Commission of Fish and Fisheries. Collective Exhibit. Groups 122, 123, 124.

**CHASE, A. J.**, Boston, Massachusetts.
**MANN & CO.**, Chicago, Illinois.
**OSGOOD, N. A.**, Battle Creek, Michigan.
**RIDGWAY PATENT REFRIGERATOR COMPANY** (Limited), Philadelphia.
**ROBINSON, WILLIAMS, & CO.**, New Haven, Connecticut.

DIVISION XXXIV.

(*b*) Models of fish-markets and appliances connected with the same.

United States Commission of Fish and Fisheries. Collective Exhibit. Group 124.

**BLACKFORD, EUGENE G.**, New York City.
**FAIRBANKS & CO.**, New York City.
**LOW, D. W.**, Gloucester, Massachusetts.

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CLASS IV.

FISH CULTURE.

DIVISION XXXV.

**Models or drawings of fish hatching, breeding, and rearing establishments, including oyster and other shell-fish grounds, and all apparatus and implements connected with the same, and for transporting fish and fish ova. Food for fry.**

United States Commission of Fish and Fisheries. Collective Exhibit. Groups 43, 153, 154, 155, 156, 157, 158, 159, 160, 161, 162, 163.

**AINSWORTH, STEPHEN H.**, New York.
**ANNIN, JAMES, JUN.**, Caledonia, New York.
**ATKINS, CHARLES G.**, Bucksport, Maine.
**BRACKETT, E. A.**, Winchester, Massachusetts.
**BRYAN, O. N.**, Occokesk, Maryland.
**CHASE, OREN M.**, Detroit, Michigan.
**CHESTER, H. C.**, Noank, Connecticut.
**CLARK, FRANK N.**, Northville, Michigan.
**COLLINS, A. S.**, Caledonia, New York.
**DELAWDER, W. G.**, Easton, Maryland.

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Renommés au Canada, en Australie, la Nouvelle Zélande, le Cap de Bonne Espérance, Natal, aux Indes et en Chine, comme uniques Fabricants de confiance des TOILES VERNIES propres à l'exportation, et dont l'arrivée à destination en bon état est garantie.

**FERGUSON, MAJOR THOMAS B.**, Washington.
**GREEN, SETH**, Rochester, New York.
**GREEN, MONROE A.**, Rochester, New York.
**McDONALD, MARSHALL**, Washington.
**MATHER, FREDERICK**, New York.
**PARKER, JOEL C.**, Grand Rapids, Michigan.
**RICARDO, GEORGE**, Hackensack, New Jersey.
**STILWELL, E. M.**, Bangor, Maine.
**STONE, LIVINGSTON**, Charlestown, New Hampshire.
**TAYLOR, THOMAS**, New Berne, North Carolina.
**WRIGHT, ISAAC H.**, Baltimore, Maryland.
**WROTEN, WILLIAM G.**, Maryland.

DIVISION XXXVI.

**epresentations illustrative of the development and progressive growth of fish.**

ited States Commission of Fish and Fisheries. Collective Exhibit. Groups 164, 165, 166.

**ATKINS, CHARLES G.**, Bucksport, Maine.
**CLARK, FRANK N.**, Northville, Michigan.
**EARLL, R. EDWARD**, Washington.
**GREEN, SETH**, Rochester, New York.
**McKESSON AND ROBBINS**, New York City.
**McDONALD, MARSHALL**, Washington.
**RYDER, JOHN A.**, Washington.
**STONE, LIVINGSTON**, Charlestown, New Hampshire.

DIVISION XXXVII.

**Models and drawings of fish passes and fish ladders.**

United States Commission of Fish and Fisheries. Collective Exhibit. Group 167.

**ATKINS, CHARLES G.**, Bucksport, Maine.
**BRACKETT, E. A.**, Winchester, Massachusetts.
**BREWER, JAMES D.**, Muncy, Pennsylvania.
**EVERLETH, F. M.**, Waldoboro, Maine.
**McDONALD, MARSHALL**, Washington.
**PIKE, ROBERT G.**, Middletown, Connecticut.
**SHAW, B. F.**, Anamosa, Iowa.
**SMITH, EVERETT**, Portland, Maine.
**WORRALL, JAMES**, Columbia, Pennsylvania.

DIVISION XXXVIII.

**Scientific investigations.**

i. Models and drawings of diseases of fish, with special reference to their origin and cure.
(No display.)

DIVISION XXXIX.

ii. Processes for rendering streams polluted by sewage and chemical and other works innocuous to fish life (illustrated by models and drawings).

United States Commission of Fish and Fisheries. Collective Exhibit. Group 167.

**ANDERSON, ABBOTT, UND ANDERSON,**

**37, Queen Victoria Street, London, England.**

FABRIKANTEN DER BESTE SORTEN VON

OELHAUT KLEIDUNGSSTUECKE FUER SEE- ODER LAND-GEBRAUCH;

ferner Oelhautdecken für Pferde- Wagen- Sonnenzelte, und ihr berühmtes Patentirtes Wasserdichtes Tuch zur Ueberziehung von Kutscher- und Wagen-Decken.

Copie des schriftlichen Zeugnisses des Herrn A. F. O. LIDDELL, vom Bureau des Minister des Inneren. HOME OFFICE, 3. *September* 1878.

Vor ungefahr sieben Jahren machten Sie mir einen Oelhaut Uebersieher, welcher in ausgezeichnetem Zustande bis zu diesem Jahre im Gebrauche ist. (Gez.) A. F. O. LIDDELL.

### Division XL.

iii. Physico-chemical investigation into those qualities of salt and fresh water which affect aquatic animals; investigation of the bottom of the sea and of lakes, shown by samples; aquatic plants in relation to fishing, &c.; researches into the aquatic fauna (animals of the several classes preserved in alcohol or prepared, &c.), apparatus and implements used in such researches.

United States Commission of Fish and Fisheries. Collective Exhibit. Groups 36, 37, 38, 43, 170, 171, 172.

**AGASSIZ, ALEXANDER,** Museum of Comparative Zoology, Cambridge, Massachusetts.

**BAILLIE,** Passed Assistant Engineer, U.S.N., United States steamer "Fish Hawk."

**BENEDICT, J. E.,** United States steamer "Albatross."

**CHESTER, H. C.,** Noank, Connecticut.

**HILGARD, PROF. J. E.,** Washington.

**POTTS, EDWARD,** Philadelphia, Pennsylvania.

**SIGSBEE, CHARLES D.,** Commander, U.S.N.

**TANNER, LIEUT. Z. L.,** U.S.N., United States steamer "Albatross."

**UNITED STATES COAST AND GEODETIC SURVEY.**

**UNITED STATES NAVY, HYDROGRAPHIC OFFICE.**

### Division XLI.

**Acclimatization of fish.**

United States Commission of Fish and Fisheries. Collective Exhibit. Group 153.

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## Class V.

## NATURAL HISTORY.

### Division XLII.

**Specimens living (marine and fresh-water), fresh, stuffed, or preserved, casts, drawings, and representations of—**

(*a*) Algæ arranged according to their various species and localities.

United States Commission of Fish and Fisheries. Collective Exhibit. Groups 34, 35.

**FARLOW, DR. W. G.,** Harvard College, Cambridge, Massachusetts.

### Division XLIII.

(*b*) Sponges, in their natural state.

United States Commission of Fish and Fisheries. Collective Exhibit. Groups 32, 146.

**McKESSON & ROBBINS,** New York City.

**POTTS, EDWARD,** Philadelphia, Pennsylvania.

### Division XLIV.

(*c*) Corals, in their natural state, polyps, jelly fish, &c.

United States Commission of Fish and Fisheries. Collective Exhibit. Group 31.

**RATHBUN, RICHARD,** United States National Museum, Washington, District, Columbia.

---

GETUIGSCHRIFT, door ANDERSON, ABBOTT en ANDERSON ontvangen, aangaande de Waterproef Schoudermantels ten dienste der Politie alsmede van Waterproef Beenbekleedsels, door deze geleverd.

Bureau van den Ontvanger der Londensche Politie,
4 Whitehall Place, S.W., den 31 Julij 1868.

NIEUW FORMAAT SCHOUDERMANTELS.

Korte Inhoud van het Rapport door de Superintendanten ingeleverd, aangaande de Model-Schoudermantels in Januarij 1868 aan de Division A, B, C, E, N, en R uitgedeeld.

De Superintendanten verklaren, dat dezer Schoudermantels, veel beter dan de vroeger gebruikten, wijnig slijten, volkomen waterdicht zijn, niet tereten en er nog goed uitzien; in de Divisie B hebben de manschappen in overeenstemming, dat zij de beste Schoudermantels zijn, die ooit aan de Politie zijn verstrekt; de Divisie B is van oordeel, dat model No. 2 een weinig beter dan No. 1 is.

(Was geteekend) THOS. KITTLE, Superintendent.

DIVISION XLV.

(*d*) Entozoa.

(No display.)

DIVISION XLVI.

(*e*) Mollusca of all kinds and shells not included in Class III.

ited States Commission of Fish and Fisheries. Collective Exhibit. Groups 21, 22, 23, , 26, 27, 28.

**MERTON, J. H.**, Peabody Museum, Yale College, New Haven, Conut.

DIVISION XLVII.

(*f*) Starfishes, sea-urchins, holothuriæ.

ted States Commission of Fish and Fisheries. Collective Exhibit. Group 31.

DIVISION XLVIII.

(*g*) Worms used for bait, or noxious; leeches, &c.

ted States Commission of Fish and Fisheries. Collective Exhibit. Group 30.

DIVISION XLIX.

erfect insects and larvæ of insects which are destroyers of spawn or serve as food for fish.

ted States Commission of Fish and Fisheries. Collective Exhibit. Group 56.

**cGOVERN, H. D.**, Brooklyn, New York.

**ILEY, C. V.**, Washington, District Columbia.

DIVISION L.

(*i*) Crustacea of all kinds.

ited States Commission of Fish and Fisheries. Collective Exhibit. Groups 29, 33.

**UCAS, F. A.**, U. S. National Museum, Washington.

DIVISION LI.

(*k*) Fish of all kinds.

ited States Commission of Fish and Fisheries. Collective Exhibit. Groups 13, 20.

**LACKFORD, EUGENE G.**, New York City.

**RACKETT, WALTER M.**, Boston, Massachusetts. (Pictures).

**REEMAN, MRS. J. H.**, Wellfleet, Massachusetts. (Pictures).

**ATHER, FRED**, New York City.

**ATHER, MRS. FREDERICK**, New York City. (Picture.)

**MILLIE, T. W.**, Washington.

**ILWELL, E. M.**, Bangor, Maine.

**ODD, H. L.**, United States Fish Commission, Washington District, nbia. (Pictures).

**ONSON, EVERETT P.**, Gloucester, Massachusetts.

**HOTO-ENGRAVING COMPANY**, 67 Park Place, New York City. ravings.)

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DIVISION LII.

(*l*) Reptiles, such as tortoises, turtles, terrapins, lizards, serpents, frogs, newts, &c.

United States Commission of Fish and Fisheries. Collective Exhibit. Groups 7, 8, 9, 10, 11, 12.

**LUCAS, F. A.**, Washington.
**SHINDLER, A. Z.**, Washington.

DIVISION LIII.

(*m*) Aquatic and other birds hostile to fish or fishing.

United States Commission of Fish and Fisheries. Collective Exhibit. Groups 5, 6.

**HORNADAY, WM. T.**, Washington.

DIVISION LIV.

(*n*) Aquatic and amphibious mammalia (otters, seals, whales, &c.) and others detrimental to fish.

United States Commission of Fish and Fisheries. Collective Exhibit. Groups 1, 2, 3, 4.

**ALASKA COMMERCIAL COMPANY**, San Francisco, California.
**HORNADAY, W. T.**, Washington.

DIVISION LV.

**Works on ichthyology, maps illustrating geographical distribution, migration, &c., of fishes and spawn.**

United States Commission of Fish and Fisheries. Collective Exhibit. Groups 39, 40, 41, 42, 43, 44, 45, 46, 173.

**AGASSIZ, ALEXANDER**, Cambridge, Massachusetts.
**ALLEN, J. A.**, Museum of Comparative Zoology, Cambridge, Massachusetts.
**BEAN, TARLETON H.**, National Museum, Washington.
**CLARK, A. HOWARD**, Washington.
**DALL, W. H.**, Washington.
**GOODE, G. BROWN**, National Museum, Washington.
**JORDAN, DAVID S.**, Bloomington, Indiana.
**LOCKINGTON, W. N.**, Philadelphia, Pennsylvania.
**MATHER, FRED.**, New York City.
**PUTNAM, PROF. F. W.**, Cambridge, Massachusetts.
**RYDER, JOHN A.**, Washington.
**SCRIBNER'S, CHARLES, SONS**, New York City.

DIVISION LVI.

**Specimens and representations illustrative of the relations between extinct and existing fishes.**

**WHITE, DR. C. A.**, United States Geological Survey, Washington.


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Aannemers voor de Levering aan het Britsche Gouvernement, van GEWAST TAFFEN KLEEDINGSTUKKEN, zooals deze worden gedragen voor Onderzeesche Mijnen en Torpedo Werken; ook van hunne Gebreveteerde wel afgewerkte GEWAST TAFFEN KNAPZAKKEN, door hen ingevoerd en voor het gebruik van het Britsche Leger aangenomen.

CLASS VI.

)RY AND LITERATURE OF FISHING—FISHERY LAWS—FISH COMMERCE.

DIVISION LVII.

**nt fishing implements or their reproductions—models—ctures—books—emblems—charters and seals of ancient ıhermen guilds.**

States Commission of Fish and Fisheries. Collective Exhibit. Groups 168, 169, 173.

**ERICAN FISH CULTURAL ASSOCIATION**, New York City.
**NTURY COMPANY**, New York City.
**NKLIN, CAPTAIN B. F.**, Jamesport, New York.
**LTON MARKET FISHMONGERS' ASSOCIATION**, New York

**THYOPHAGOUS CLUB**, New York City.
**LLIPS, BARNET**, New York City.
**J, DR. CHARLES**, Washington.
**NLEY, HENRY O.**, Dixfield, Maine.

(For Pictures—*See* under Division LI.)

DIVISION LVIII.

**Fishery laws of different countries.**

(*See* under Division LXI.)

DIVISION LIX.

**ı of treaties, conventions, &c., dealing with international fishery relations.**

(*See* under Division LXI.)

DIVISION LX.

**ɔorts, statistics, and literature of fish, fishing, and fisheries.**

(*See* under Division LXI.)

DIVISION LXI.

**orts on acclimatization of fish, and of attempts in this direction.**

ited States Commission of Fish and Fisheries. Collective Exhibit. Group 173.

**LEN, J. A.**, Museum of Comparative Zoology, Cambridge, Massachusetts.
**ERICAN ANGLER**, New York City.
**ERICAN FIELD**, Chicago, Illinois.
**VATER, PROF. W. O.**, Middletown, Connecticut.
**RTLETT, JOHN**, Cambridge, Massachusetts.
**AN, DR. TARLETON H.**, United States National Museum, ton.
**RK, A. HOWARD**, United States National Museum, Washington.
**LLINS, JOSEPH W.**, United States Fish Commission, Washington.

COPY OF TESTIMONIAL GIVEN RESPECTING

**ANDERSON, ABBOTT, AND ANDERSON'S**

REGULATION ARMY WATERPROOF CLOAK.

HEAD QUARTERS, R.V.C., BERWICK-UPON-TWEED, *May* 25, 1877.

GENTLEMEN,—I have sent the Regulation Cloak that I purchased from you some five or six years go. Will you have the goodness to put a new collar on it, and return to me.

In justice to yourselves I ought to mention that the cloak in question has seen a good deal of ough work, and with the exception of the collar is not very much the worse.—Yours obediently,

(Signed) ROBERT WEDDELL, CAPTAIN, 1st. B., R.N.R.

Messrs. ANDERSON, ABBOTT, and ANDERSON, *Queen Victoria Street*, London, E.C.

**DALL, CAPTAIN W. H.**, United States Coast Survey, Washington.
**EARLL, R. E.**, United States Fish Commission, Washington.
**ELLIOTT, HENRY W.**, Washington.
**FAXON, WALTER**, Museum of Comparative Zoology, Cambri Massachusetts.
**FEWKES, J. WALTER**, Museum of Comparative Zoology, Cambri Massachusetts.
**FOREST AND STREAM PUBLISHING COMPANY**, New Yo
**GOODE, G. BROWN**, National Museum, Washington.
**HARGER, OSCAR**, Peabody Museum of Yale College, New Ha Connecticut.
**JORDAN, PROF. DAVID S.**, Indiana University, Bloomington, Ind
**LOCKINGTON, W. N.**, Philadelphia, Pennsylvania.
**MUSEUM OF COMPARATIVE ZOOLOGY**, Cambridge, Ma chusetts.
**PACKARD, PROF. A. S., JUN.**, Providence Rhode Island.
**PROCTER BROTHERS**, Gloucester, Massachusetts.
**RATHBUN, RICHARD**, United States National Museum, Washing
**RIDGWAY, ROBERT**, United States National Museum, Washing
**RILEY, C. V.**, United States Department of Agriculture, Washing
**RYDER, JOHN A.**, United States Fish Commission, Washington.
**SCAMMON, CAPTAIN C. M.**, United States Revenue Marine, Sa Francisco, California.
**SCRIBNER'S, CHARLES, SONS**, New York City.
**SEA WORLD PUBLISHING COMPANY**, Baltimore, Md.
**SMILEY, C. W.**, United States Fish Commission, Washington.
**SMITHSONIAN INSTITUTION**, Washington.
**SWAN, JAMES G.**, Port Townsend, Washington Territory.
**UNITED STATES COAST & GEODETIC SURVEY**, Washing
**UNITED STATES DEPARTMENT OF THE INTERI CENSUS OFFICE**, Washington.
**UNITED STATES DEPARTMENT OF THE INTER PATENT OFFICE**, Washington.
**UNITED STATES DEPARTMENT OF THE TREASU BUREAU OF STATISTICS**, Washington.
**UNITED STATES NATIONAL MUSEUM**, Washington, Dis Columbia.
**VERRILL, PROF. A. E.**, Yale College, New Haven, Connecticut.
**WILCOX, W. A.**, Secretary Boston Fish Bureau, Boston.
**WINSLOW, LIEUTENANT FRANCIS**, U.S.N., United States Fi Commission, Washington.


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# AUSTRIA-HUNGARY.

(*See Plan, p.* 76.)

*Official "Introduction," containing general information concerning the Fisheries of Austria-Hungary, compiled from the latest Reports and Statistics, has not yet been received, but will appear in the next Edition of the "Official Catalogue."*]

UR DIÓSY, Esq., *Honorary Commissioner*, Linaro Lodge, 7 Lansdowne Road, ington Park, W.

DIVISIONS VI.

**KUNSTÄDTER, J. J.**, Marine and Mechanical Engineer, Budapest, ry. London address, 75 Herbert Street, Hoxton, N. Model of a Screw Steam-ship with Kunstädter's Patent Screw Steering-Gear, an arrangement for connecting the propeller with the steering-gear by means of a universal joint, by which the handiness eed of the ship when being steered are vastly increased, and the risk of collision is sed. Especially useful for Steam Fishing Vessels and Steam Carriers steering over -grounds crowded with sailing craft. Fitted to vessels of the Imperial and Royal Austro-rian Navy, and of the fleet of Mail Packets of the Austro-Hungarian Lloyd Company, ste, plying to the Levant, Egypt, and Bombay, and to Clyde Steamships and Sailing- with auxiliary steam power. The model exhibited is a working model, and mpanied by printed descriptive circulars and diagrams, and reports of the working of ention.

DIVISION XXI.

**DIÓSY, ARTHUR**, *Honorary Commissioner*. A Glass Case, containing: nder-pouch ("Kova-Zacskó" in the Magyar language), used by Hungarian Fishermen l Fisheries). The pouch is of white leather, elaborately embroidered in the national s (red, white, and green), with plaited thongs to pass through the sash or] girdle. To are attached a heart-shaped steel and a pipe-cleaner of wire. The pouch contains rts of tinder (Magyar, "Kova") of dried fungus, and a piece of flint. By its use the rian Fishermen can strike a light in the most stormy weather. (2) Two Fishermen's e (Magyar, "Bicsak"). Blades almost triangular, with clasp. The handles of y-stained wood, red and yellow. Sold by Slovák hawkers from Northern Hungary out a halfpenny each. (3) Hungarian Fisherman's Knife and Fork, in case covered eather, which is worn in the high boot. The handles of knife and fork (two-pronged) are with white metal on brown wood. (Magyar name of the knife, fork, and case, "Halász-"). (4) Three Hungarian Fishermen's Pipes (Magyar, "Pipa"). One of red clay with er, one of dark mottled clay with silver cover, and one of earthenware, representing a Maïze, with silver cover. The stems of all are of cherry-wood, the mouthpieces of horn. The first kind is used by the fishermen of Lower Hungary (banks of the Lower e), and is made at Debreczin, the second, from Selmecz (Schemnitz), is used by the en of the North, and the third, from Budapest, by the fishermen in the neighbour- of the capital, on the Danube. All Hungarian and Austrian fishermen are great rs. The covers to the pipes are rendered necessary by the ever-present danger of fire st a population living chiefly in wooden houses (thatched over), or in cabins of (5) Pipe ("Pfeife") of Austrian Fisherman, from the Lake District of the Tyrol pper Austria. Wooden bowl, lined with tin, brass cover, cherry-wood stem, black horn piece. Price, in the country, about one shilling and twopence. (6) Pipe of Styrian rman of the latter half of the 18th century. The bowl of wood, inlaid with mother-of- curious brass wire cover, mouthpiece of black horn. (7) A Figure, about the size of a of four years old, completely dressed as a Hungarian Fisherman, in the Costume worn in stricts along the banks of the Danube (Magyar, "Duna") the Theisz (Magyar, "Tisza"),

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Copie des schriftlichen ZEUGNISSES des Herrn Superintendent KITTLE.
Bureau des Verwalters des Metropolitan Polizei-Districts,
4 Whitehall Place, S.W., 21. *Juli* 1869.

NEUE-MUSTER-MAENTEL.

Auszug des Berichts der Superintendenten über die Muster Mäntel, welche, am 7. Januar 1868, an die A., B, C, K, N und R Divisionen ausgetheilt wurden.

Die Superintendenten melden, dass die fraglichen Mäntel dem alten Muster bedeutend vorzuziehen sind, indem sie sich im Gebrauch gut gehalten haben, wasserdicht sind, und beim Zusammenfalten nicht brechen. Dieselben sind bei der R Division noch in guten Zustand, und ist die Mannschaft der Meinung, dass dieselben bei weitem die besten Mäntel sind, welche jemals zum Dienst ausgegeben wurden. Die B Division betrachten No. 2 Muster als etwas besser als No. 1. (*Ges.*) THOS. KITTLE, Superintendent.

and the Lake Balaton (called on English maps "the Platten Sea or Lake"). The costu consists of a white linen shirt (Magyar, "Ing") with very wide open sleeves, very wide wi linen drawers (Magyar, "Gattya"), high black boots (Magyar, "Csizsma"), and a ro wide-brimmed soft hat ("Magyar, "Kalap") of black felt, in the band of which a feather a a pipe are generally stuck. The small waistcoat of red or blue cloth, richly braided wi gold, is only worn on holidays, when the three handkerchiefs of the national colours are to the girdle. The cloak (Magyar, "Szür") of white cloth, lined red and richly embroid with flowers in worsted, is always worn thrown on the left shoulder, leaving the right a free. In winter it is replaced by a cloak of sheepskin, called "Bunda." The hair is long, and sometimes plaited. The moustache is always worn. The Fishermen are gen tall, slim, swarthy, with small hands and feet for their stature, aquiline noses, high cheek bones, and a very erect bearing. They are muscularly strong, and possess great power of endurance.

DIVISION XXVI.

3. **TOPICH, ANTONIO,** Island of Lissa, Dalmatia. (1) Sardines a Anchovies, salted, in barrels. (2) Sardines, Anchovies and Mackerel, salted and prepared oil, in tins. (3) Sardines, Anchovies, and Mackerel, salted and prepared in oil, in barrels

DIVISION XXXV.

4. **SCHWARZ, JOSEF,** Manufacturer of Tin Utensils, Wiener Str No. 31, St. Pölten (Lower Austria). Apparatus and Implements for Fish Hatching, for Tr porting and Feeding Fish and Fry, and for Transporting Ova. (1) A Hatching Tray, on Californian system. (2) A Breeding Tray on the Californian system. (3) The same for a brook. (4) Funnel-Shaped Hatching Box. (5) Hatching Box for Trout. (6) Box Trout Fry. (7) Floating Hatching Apparatus, with lid. (8) Apparatus for contain with drawers. (9) Transporting Cans. (10) Three Transporting Cans, barrel-shaped, w bellows, portable and improved. (11) Transporting Can, automatic. (12) Feeding App for young fish. (13) Feeding Apparatus for Fry. (14) Hatching Tank (own inv The apparatus manufactured by Jos. Schwarz has received the following awards: medal (State Prize) at the Exhibition at Graz, Styria, 1880, medals at the Agricu Exhibitions at Leibnitz, Hungary, and St. Pölten, and at the Fisheries Exhibi Würzburg and Berlin, and Diploma of Honour of the First Austrian Piscicultural Congre Kammer, Upper Austria.

5. **GASCH, ADOLF** (Tenant Farmer of H. I. & R. H. the Archd Albrecht), Member of the German Fisheries Association, Kaniów, Galicia (Austrian Po nearest post town Dziedzitz (Austrian Silesia). [See also Division 51.] Manu Pamphlets, Diagrams, and Illustrations, being descriptions of the celebrated Fish-b Ponds of Kaniów, and laying down principles of pisciculture, and of the utilisation of the p for agricultural purposes. (In the German language.)

5*a*. **RÉVAY, THE BARON GYULA,** Styavnicska, post town Szem Turócz (County), Hungary. Specimens, preserved in spirits, of Fish of various ages, bred by the Exhibitor, viz.:—(1) Trout, *Salmo Fario* (Magyar, "Pisztráng;" German, "Forel (2) Char, *Salmo Salvelinus* (Magyar, "Szemling;" German "Schar," "Reutel;" Austr German, "Saibling"). (3) Hybrids, between *Salmo Fario* and *Salmo Salvelinus*. (4) Spe mens of Ova and Fry of the above-named Fishes. (5) 2 Photographs framed. Views of Baron Révay's Fish-breeding Establishment at Styavnicska. (6) Circulars, for distribu in English and French, describing the Establishment, &c. Awards: Silver Medal, Pa International Exhibition, 1878, Gilt Bronze Medal, Székes-Fehérvár (Hungary).

DIVISION XXXIX.

5. **GASCH, ADOLF,** (Tenant Farmer of H. I. & R. H. the Archd Albrecht), Member of the German Fisheries Association, Kaniów, Galicia (Austrian Po nearest post town Dziedzitz (Austrian Silesia). [See also Division 51.] Manu

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s, Diagrams, and Illustrations descriptive of a simple and practical method for streams polluted by chemical or other works innocuous to fish life. (MSS. and s in German.)

**WESNY, A.**, Olmütz, Moravia. A manuscript (in German), with rings, descriptive of Exhibitor's method of purifying and disinfecting, by means al filters and other appliances, streams polluted by factories and noxious to fish. uch improved by inventor since it was shown at the Fisheries Exhibitions at Berlin burgh.

## Division L.

**ALLE, ANTONIO**, Municipal Museum of Natural History, Trieste. llection of Parasitic Crustacea which live on and in the Fishes of the Adriatic (eighty-rent specimens, in spirits). (2) Three Pamphlets (in Italian) by the Exhibitor, e of specimens in the collection, viz. (*a*) "Crostacei Parassiti dei Pesci del Mare " Trieste (Tip. del Lloyd Aust.-Hung.), 1880, pp. 38, bound in 1 vol., royal 8vo., ppendix, dated 1882, pp. 3, and a MS. Appendix, pp. 2. The pamphlet is a reprint 'Bollettino della Società, Adriatica di Scienze Naturali in Trieste" ("Transactions riatic Society of Natural Sciences in Trieste"), vol. VI., part I., 1880. The printed is a reprint from the same "Bollettino," vol. VII., part I., 1882. The MS. Appendix . (*b*) "Sopra due Specie di Crostacei Parassiti dell' *Oxyrrhina Spallanzani, Raf.*" rom the "Bolletino," (see above), fourth year, No. 1, Trieste, 1878, pp. 4, with ed plate. (*c*) "*Cirolana hirtipes, M. Edw.* nella *Thalassochelys corticata, Rondel.*" rom the same "Bolletino," fourth year, No. 4, Trieste, December, 1878, p. 1. (*d*) a specie nuova del Genere *Stellicola K'sm.*" Reprint from the aforesaid "Bollettino," , No. 1, Trieste, 1880, pp. 4. (*c*) and (*d*) are bound together in 1 vol., royal 8vo. (3) i Parassiti dei Pesci del Mare Adriatico," Trieste, 1882, foolscap fo., pp. 136. This and unique work consists of sixty-six pencil drawings, highly finished, by the illustrating his collection of Parasitic Crustacea of the Adriatic fishes, and the result of years of research. Many of the drawings are from microscopical Each drawing is accompanied by a page of MS. description, and the whole, with and illuminated titlepage, bound in purple morocco, tooled, gilt edges.

—It having been found impracticable to exhibit this valuable work to the general public on the open mere exhibition in a glass case depriving it of its utility as a guide to the collection of specimens, it has d with the Secretary to the Executive Committee, for safe keeping. Persons wishing to inspect the requested to apply in writing to the Hon. Commissioner, Mr. A. Diósy, who will appoint a day and time n have access to the work.

## Division LI.

**SCH, ADOLF** (Tenant Farmer of H. I. & R. H. the Archduke Member of the German Fisheries Association, Kaniów, Galicia (Austrian earest post town Dziedzitz (Austrian Silesia). Specimens of Carp ("Karpfen," ; in Polish, "Karp), *Cyprinus Carpio*, of various ages, bred by Exhibitor ding ponds at Kaniów. Specimens preserved in spirits. For information concerning g ponds of Kaniów and their utilisation for agricultural purposes, see Exhibitor's MSS., and Diagrams, Exhibit No. 5 Division 35. (Fish Culture.)

**GAZZY, THE COUNT VILMÓS**, President of the Upper Fisheries Association, Aranyos-Maróth, Hungary. Collection of various species of d in Hungary. [Specimens preserved in spirits.]

**OSSOVICH, ANDREA**, Municipal Museum of Natural History, ome Fishes of the Adriatic, in Galvanoplastic representations.

**JDERA, KARL**, Wholesale Dealer in Objects of Natural History, ring (Wien), Vienna. (1) Specimens of Fishes of Austria-Hungary and the adjacent untries, stuffed and preserved in spirits. (2) Skeletons of the same.

THOMAS BLAND & SONS,
Gun and Rifle Manufacturers and Merchants,
106, STRAND, LONDON;
ND LIVERPOOL AND BIRMINGHAM.

## Division LII.

**GUDERA, KARL,** Wholesale Dealer in Objects of Natural Histo
9 Kolowratring (Wien), Vienna. (1) Specimens of Reptiles of Austria-Hungary and
Southern Borderlands, stuffed and preserved in spirits. (2) Skeletons of the same.

## Division LV.

11*a*. **NOWICKI, DR. MAXS,** Professor of Zoology at the Univers
Krakow, Galicia, President of the Galician Fishery Association. Map showing the Distri
tion of Fish in the rivers and lakes of Galicia (Austrian Poland), with Statistical Ta
Krakow, 1883.

## Division LX.

12. **FABER, GEORGE LOUIS,** Her Britannic Majesty's Consul
Fiume, Hungary. A work, "The Fisheries of the Adriatic and the Fishes thereof," by
Exhibitor, being a report on the Austro-Hungarian Fisheries in the Adriatic, with nu
illustrations, prepared specially for the purposes of this Exhibition by George L. Faber.
an introduction by Dr. Günther, F.R.S., of the British Museum. One vol. small 4to.
20 woodcuts, after Leo Littrow, &c. London, 1883.

Note.—It having been found impracticable to exhibit this valuable work to the general public on the
counter, and mere exhibition in a glass case depriving it of its utility as a Work of Reference, it has been de
with the Literary Superintendent of the Exhibition, in the Library of the Press-Room, where it may be
application.

13. **MARCHESETTI, DR. CARLO DE,** Director of the Mun
Museum of Natural History, Trieste. Two copies of a work, in Italian, entitled, "La P
lungo le Coste Orientali dell' Adria," by the Exhibitor, Trieste, August, 1882, pref. ii., pp.
appendix ii., and index, royal 8vo. (Typ. Lodovico Herrmanstorfer.) Published by the Im
and Royal Austro-Hungarian Maritime Board ("Governo Marittimo,") for the purposes of
Austro-Hungarian Exhibition at Trieste, 1882. Presented by the Exhibitor to the Exe
Committee of the London International Fisheries Exhibition, 1883. This work contains
the latest official information and statistics concerning the fisheries and fish of the
coasts of the Adriatic.

Note.—Italian is the chief language of the Austrian sea-board as far as the boundary of Hungary. B
along the Hungarian Littoral Territory and the Coast of Dalmatia and the adjacent islands various Sclav
languages, such as Illyric, Slavonian, Dalmatian, Croatian, &c., are spoken.


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Copie des schriftlichen Zeugnisses des Herrn A. F. O. Liddell, vom Bureau des Minister des Inneren.

Home Office, 3. September 1879

Vor ungefahr sieben Jahren machten Sie mir einen Oelhaut Ueberzieher, welcher in ungezeichnetem Zustande bis zu diesem Jahre im Gebrauche ist. (Gez.) A. F. O. Liddell.

# BELGIUM.

(*See Plan, p.* 176.)

ɔrtant fishery of Belgium is the maritime fishery, which is extensively the shores of the North Sea and in Western Flanders, especially at Ostend. fishing industry has greatly developed.

harbours of Ostend, Blankenberghe, Heyst, Panne, and Nieuport, which boats in 1836, had 318 in 1880. Ostend alone, the most important fishing in 1836 82 fishing-boats, 185 in 1880, 206 in 1881, and 178 in 1882.

the Government has exerted itself by every means to encourage and develop stry upon the Belgian coasts. Those engaged in it enjoyed an exemption from of dues, and government grants in aid of the fishery were allowed annually 1866. These grants in no way assisted the development of the fisheries; in tance diminished year by year. In 1864 those interested in maritime fishing nxiety for its future. The Government thereupon appointed a commission 55) for the purpose of inquiring into the condition of this fishery, and to take for its preservation. The report of the commission presented to the Chamber es on the 17th May, 1866, recommended the entire abolition of the grants to eries; it applied for the foundation of a school for seamen on board a vessel rcise at sea the supervision of the fishery: and it also recommended the free om all nationalities. Besides this the commission considered that for the t of its fisheries the country must rely upon private enterprise, a good he fishery fleet, and a fair rate of wages for the fishermen. The Government l to carry out the recommendations of the commission.

were definitely suppressed in 1867. The Government chartered at the same ssel for the supervision of the fishery. They instituted likewise a school for l for the crew of the fleet. Each year, this ship, at the commencement of r four months in the North Sea in the midst of our fishing-boats. Its mission e fishermen from neglecting their duty by smuggling upon the coast of e them help and advice, and to furnish them with medical aid in cases

nding the foundation of the school for seamen, which numbers at present sixty ccount of the increase of the number of fishermen's boats, complaints are made of procuring the requisite crews. This arises from the fact that most of l on the guardship enter the mercantile marine, the mail service, or work in as soon as the guardship, on its return from the summer cruise, winters in the The school for seamen trains therefore good sailors but few fishermen—hence o remedy this state of affairs, it is proposed that the Government should utter to be constructed, manned with seamen from the guardship, who, in vote themselves to net fishing. These young men would thus learn net-fishing hey learnt fishing with hooks. They would then be more surely retained for ndustry of our coasts. The cutter in question would in addition be provided l improvements, such as a steam winch for raising the net. It could, besides, al ports and fish depôts of England for general information.

e time that the Government abolished the premiums and established the training-, it suppressed all restrictive regulation of fishing, such as the law respecting esh of the nets according to the time of year, to prevent the destruction of fry. petent to judge expressed an opinion that these measures, besides being hermen, did not benefit the fishing industry, and that, no matter what might f fishing employed, there was no reason to fear a scarcity of fish in the North t, both in this country and in Holland, since the free system was introduced, opinion was well founded.

aw abolished the inland duties established on salt, and sea water; article 2 pression of the dues on all fish importations.

Our sea fishery, freed from all restrictions, has not been slow in developing.

As stated in the first part of this report, the number of smacks has consi increased, and their construction has also improved. Our shipowners, in imitation English, have adopted boats that for shape and rigging will bear comparison wi Built for rapid sailing, which is necessary for abundant harvests of fish, they a unsatisfactory, but that is the fault of the fishermen, who cannot handle them so dex as their English neighbours.

It is an incontestable fact that, although since 1830 prices have at least doub sale of sea fish has grown enormously. Fish always abounds in the market of Ost the supply increases every year. Since 1875 the municipality of Ostend has taken management of the fish market. The following is a table of the annual proceeds of the fish at this market since its acquisition by the corporation :—

| Produce. | 1875. | 1876. | 1877. | 1878. |
|---|---|---|---|---|
| English . . | 333,812·50 | 457,142·30 | 424,788·05 | 539,867·[illegible] |
| French . . | 471,655·10 | 568,360·00 | 344,105·80 | 623,608·[illegible] |
| Dutch . . | 9,682·20 | 8,543·60 | 8,376·20 | ,, |
| Other Nations | 1,565·00 | 14,945·00 | 10,037·00 | 28,540·[illegible] |
| Belgian . . (Ostend) | 1,490,956·85 | 1,577,984·65 | 1,800,394·85 | 1,884,732·[illegible] |
| Total frs. . | 2,307,671·65 | 2,626,975·55 | 2,587,701·90 | 3,076,768·[illegible] |

| Produce. | 1879. | 1880. | 1881. | 1882. |
|---|---|---|---|---|
| English . . | 641,242·55 | 442,445·89 | 363,355·00 | 586,323·[illegible] |
| French . . | 437,543·20 | 544,936·15 | 605,447·40 | 615,219·[illegible] |
| Dutch . . | ,, | ,, | 2,090·50 | 1,619·[illegible] |
| Other Nations | 76,102·50 | 2,248·30 | 592·94 | 58,339·[illegible] |
| Belgian . . (Ostend) | 1,842,934·20 | 2,520,089·05 | 1,953,256·20 | 2,207,073·[illegible] |
| Total frs. . | 2,997,822·45 | 3,489,719·39 | — | 3,468,587·[illegible] |
| Cod liver oil . | — | — | 268·50 | — |
| Total . . | — | — | 2,925,010·54 | — |

The following is the produce for the two first months of 1883 :—

| | Belgian. | English. | French. | Sundries [illegible] |
|---|---|---|---|---|
| January ..... | 271,193·05 | 44,259·50 | 58,312·50 | 11,[illegible] |
| February ..... | 239,956·60 | 39,674·00 | 40,056·70 | [illegible] |
| Total ..... | 511,149·65 | 83,933·50 | 98,369·20 | [illegible] |

This considerable development of national fishery does not appear to have sui the importation of fish in vessels other than fishing vessels, nor by what is brought And yet these importations have greatly increased, steamers arriving at Antwerp half-laden with fish, from Hull and Grimsby. Besides this, a great deal comes by Holland. The following is a statement of the foreign trade during the last two years :—

| Importation and Exportation. | Herrings. | | Other Fish. | |
|---|---|---|---|---|
| | 1881. | 1882. | 1881. | 1882. |
| Importations, kilog. . | 7,553,597 | 8,536,998 | 8,571,000 | 7,870,81[illegible] |
| Exportations ,, . | 70,765 | 270,005 | 996,641 | 1,159,83[illegible] |

Our shipowners are, at the same time, contractors. They supply sails, ropes, ferry boats, ·els, &c.—in fact, everything. They have coopers' sheds, sail-lofts, &c. Our fishermen plain that they are not so well paid as the English fishermen, notwithstanding the enor- s profits realised by the shipowners. The fishermen receive only 6 per cent. on the eeds of the sale. Furthermore, 1 per cent. of this allowance is kept back, for the purpose aking good losses, resulting from the loss of fishing-tackle, ropes, &c., which loss is ged to the fishermen and owners, and when, at the end of the season, the accounts balanced, the share to be paid by the fishermen is deducted, either from their salary, or their share of the proceeds of the fishery.

For a long time there has existed a Fishermen's Aid Society, an association of mutual ance, which provides help for members when they can no longer go to sea. In order to nt a taste for fishing among the children of the population on the sea coast, and to give at an early age some knowledge of it, an elementary acquaintance with the subject is rted in some of the normal schools. Monsieur Ch. De Smet of Ostend is one of the oters of the idea of giving instruction in fishery matters in these schools. He has also exhibited life-sized diagrams of the principal fish of our coasts. His collection, which hown at the National Exhibition of 1880, is now at the *École Communale* at Ostend.

---

Besides the maritime fishing, we have in Belgium river fishing, which, though less rtant, is still of great value on the ground of public revenue and as a food product.

The mountainous parts of our provinces are in a great measure restricted to river and n fish, on an average dearer, less nutritious and more irregular in the supply than sea fish. Considering the numerous and various advantages which the fresh-water fisheries present, n view of the impoverishment of our streams, the Government had for a long time been d to reform the legislation concerning fishing, which was governed by laws dating as ack as 1669 and 1804. A new law was instituted on the 15th February, 1883. Good ts are expected from this law, and the measures which will be taken to enforce its rvance.

The following are some figures relating to the distance in kilomètres of the right of ng in rivers, streams, canals or parts of them, let out by contract.

*Rivers and Streams.*—Basin of the Escaut, 514,517 kilos; Basin of the Meuse, 540,238 ; Basin of the Yser, 45,534 kilos; total, 1,100,289 kilos. *Canals.*—Basin of the Escaut, 898 kilos; Basin of the Meuse, 65,841 kilos; Basin of the Yser, 39,819 kilos; other ls, 175,668 kilos: total, 699,226 kilos. Grand total, 1,799,515 kilos.

The inspection and preservation of fishing in streams through public lands is vested in Belgian Department of Woods and Forests (*L'Administration Forestière*).

In the public canals and rivers, the fishing is let by tender, as in other state provinces, y licence when no other offers are made. There are fixed scales which form the basis of e two ways of letting.

The fishery rents amounted to—In 1861, 40,180·58; 1865, 43,369·71; 1870, 40,088·97 , 52,365·21.

To assist in re-stocking our streams, the Government, on the 21st January, 1883, issued yal decree, by which fishing is prohibited for the space of one year in those parts of ams, not navigable, that run through domains subject to the Department.

In 1861 certain parties interested in such matters founded the "Belgian Society of iculture." Its object was to create one or more ichthyological establishments, to propagate, rding to the best method, all fish, crustaceans and molluscs, of this and other countries, ch are considered the most useful for consumption. This society was subsidised by Govern- t until 1866, when the stoppage of State grants caused the society to be wound up. It never been a great success, nor produced any important results. Its failure, however, l not make us despair for the future, as the question of artificial fish-rearing is still paratively an open one.

---

DIVISION I.

**CASTEELS DE COENE, HENRI,** 10 Rue du Cercle
Ropes of all kinds, trawling-nets and tackle. All mounted ready for use.

**EVERAERTS-DESMIDT, D.,** 12 Quai de l'Empereur
Tackle used in cod-fishing at the Dogger Bank. Tackle for deep-sea fishing a
Islands and Iceland. Bait for Dogger Bank Fishery.

**PEDE, AUGUSTE,** 52 Rue de l'Est, Ostend. Fishing N
vessel "Gouverneur Heyvaert," with arms, cable, yard, two net-irons, and access
for launching. This net has the form of a cone, whose axis is from 20 to 22 mètres, t
of the bar being 12 mètres. Length of yard 12 mètres (on the ground).

**PYCKE, O.,** St. Georges. (1) Drag Net. (2) Two Sm
accessory to fishing. (3) Fishing Ropery. (4) Two Osier Landing Nets. (5)
Spinning and Weaving.

**VILLE DE BLANKENBERGHE.** (1) Smack c
equipped (model). (2) Cable. (3) Line. (4) Bowline. (5) Anchor. (6) La
Gaff Hook. (8) Flare-up. (9) Compass. (10) Lead Sounding Line. (11) F
(12) Hammer. (13) Pitch Kettle. (14) Pail. (15) Water Barrel. (16)
Trouville Chain. (18) Net Irons. (19) Yards for shooting the Net. (20) Coi
Three. (21) Other Anchors. (22) Buoys, Two. (23) Another Net. (24) Sar

**VILLE DE HEYST-SUR-MER.** Pole Nets:—(1) Two
Codfish. (2) Two Haddock Nets. (3) Five Anchors. (4) Two Chains (buoy).
Ropes for Buoys. Nets:—(1) Folding Net. (2) One ditto, *à cartelet.* (3) One
(4) Various Lines. Large Net:—(1) Net. (2) Net Rod. (3) Net Irons. (4)
Cable. (6) Cable, Trouville. (7) Cable for Net. (8) Sardine Net. (9) One
Pole. (11) Rods. (12) Net for Prawns. (13) Two small embarkations for fish
Sailors' Cutfits.

DIVISION II.

**PANESIE, J.** (1) One model of Cutter. (2) One Model o
Cutter.

**PANESIE, RYEX,** Ostend. Half Model and Plan of a We
Trawler.

DIVISION III.

**SOCIÉTÉ ANONYME BELGE DE LITHO-PEINTU**
Place de Brouckere, Brussels. (1) Ten large Pictures illustrating the fisheries of
(2) Sixteen Pictures (reduced from the preceding ten).

DIVISION IV.

**DEWEERT, LOUIS,** 45 Quai du Chantier, Ostend. Model
fishing smacks, with plans.

**DE WYMMER, JOSEPH,** Rue des Frères, Ostend. Dand
rigged, with plans.

DIVISION V.

**DAMBOIS & CIE.,** Rue Havresse 30, Liège. (1) Sail Cloth
for sea use. (1) Sail Cloth tanned and made waterproof by a new process. (2)
samples of tanned Cables. This tanning prevents the decay of sail cloth, nets, ropes,
the action of salt water.

**DOBBELAERE HULIN, P. B.,** Officer of the Order of L
Ghent. Collection of Sail Cloths, English breadth 24 inches or 61 centimètres. (
Dutch breadth 30 inches or 76 centimètres. (3) 8 rolls Cloth, "Marine Reva
quality, Italian hemp. (4) 6 rolls Sail Cloth, 76 centimètres broad, used in Dutch

ANDERSON, ABBOTT, AND ANDERSON'S
INDIA-RUBBER MATS.
SUITABLE FOR
SHIPS, YACHTS, STEAMERS, CARRIAGES, ETC.

**VERTONGEN, GOENS,** Termonde. Coil of Rope used for eries.

**VROOME, ALBERT,** Place du Commerce, Ostend. Sail Cloth for ing Vessels, 46 rolls.

**WILFORD, WM.,** Knight of the Leopold Order, Tamise. Collection ail Cloths, English and Dutch. (1) Seven bolts, Imperial quality. (2) Four bolts Royal y quality. (3) Six bolts, Extra Navy quality. (4) Six bolts Merchant Service quality. Two bolts Cotton Duck. (6) Two bolts Tarpaulin. (7) Four bolts Duck Canvas. (8) bolts Tent Cloth.

DIVISION VI.

**DE COENE, PHILIPPE,** Ostend. Capstan. May be worked with les or handspikes.

DIVISION VIII.

**GRANDJEAN, DEMORY,** Tailfer Lusten. Materials of every iption for line fishing.

DIVISION IX.

**GOLDENBERG, C. E.,** Antwerp. Life-Boat.

DIVISION XIII.

**SOLY, J.,** Rue de la Princesse, Antwerp. Nets for Freshwater g.

DIVISION XIV.

**GRANDJEAN, DEMORY,** Tailfer Lusten. Rods for Salmon ng, Lines, Traps, &c.

DIVISION XV.

**GRANDJEAN, DEMORY,** Tailfer Lusten. Trout Rods, Lines, s, &c.

**SIEGEOIS, HUBERT,** Aîné, Durbuy. Trout Rod.

DIVISION XVI.

**GRANDJEAN, DEMORY,** Tailfer Lusten. Pike Rods, Lines, &c.

DIVISION XVII.

**GRANDJEAN, DEMORY,** Tailfer Lusten. Nets and other ances suitable for catching eels.

**POHL-ADLER, PIERRE,** St. Ghislain. Eel Traps made of osier (two).

**PYCKE, O.,** St. Georges. Net (*didon*) for catching eels.

**GENS, VERVIERS.** (1) Net for Fresh-water fishing. (2) One of Mussels.

DIVISION XIX.

**GRAF, EMILE,** 8 Passage Lemoinier, Liège. (1) Fisherman's et for carrying provisions. (2) Leather Case for carrying fishing rods. (3) Fishing rs.

**VILLE DE BLANKENBERGHE.** (1) Fisherman's Costume. Fisherwoman's Costume.

DIVISION XXI.

**GOLDER, ALF. F.,** Ostend. A collection of wooden shoes for men and fisherwomen.

SPORTSMEN, TOURISTS, & OTHERS
Are invited to inspect the
STOCK OF INDIA-RUBBER & WATERPROOF ARTICLES
Of every description at
ANDERSON, ABBOTT, & ANDERSON'S
before purchasing elsewhere.

DIVISION XXXIV.

**ASSOCIATION COMMERCIALE INDUSTRIELLE** [illegible] **MARITIME,** Ostend. Supplement to the General Plan of the Fishery Basin, containing table showing the railway system connecting Ostend with the principal localities of Europe. (2) Table showing the quantity of fish sold at the Ostend *minque* from 1875 to 1883.

DIVISION XLII.

**LANZWEERT, EDOUARD,** Rue de la Chapelle 85, Ostend. Thalassiophytes of the coasts of Ostend.

DIVISION XLIV.

**LANZWEERT, EDOUARD,** Rue de la Chapelle 85, Ostend. Four Frames. Collection of polypi from the Belgian shores.

DIVISION LI.

**EVERAERTS, DESMIDT, D.,** 12, Quai de l'Empereur, Ostend. Barrels of Codfish—Season 1883.

**POHL-ADLER, PIERRE,** St. Ghislain. (1) Sturgeon, killed by Exhibitor, length 2·17c. (2) Carp, caught by Exhibitor in the Condé Canal. (3) Otter killed by Exhibitor.

DIVISION LVII.

**FLORENVILLE, CHARLES & DEGUAITA, EDWARD,** [illegible] de Joie, Liège. Certificate, suitable for Corporations and Public Bodies, in water-marked [illegible] to be reproduced on Stone.

DIVISION LVIII.

**BELGIAN GOVERNMENT.** The law of the 19th Jany., 18[illegible]

DIVISIONS LX. AND LXI.

**ADMINISTRATION DES PONTS ET CHAUSSÉES** [illegible] **BELGIQUE,** Ostend. General Plan of the Fishery Basin at Ostend, of the *minque*, [illegible] their abutments.

**DE CLERCQ, G. A.,** Inspecteur-Général des Ponts et Chaussées, [illegible] Rue Joseph II., Brussels. Pamphlet entitled "Fish Culture and the Re-stocking of Belgian Waters." (La Pisciculture et le repeuplement des eaux belges).

**GENS, EMILE,** Verviers. (1) A Pamphlet, entitled, "de la [illegible] tion du poisson d'eau douce en Belgique." (2) A Report, addressed to the Minister of [illegible] on the Fisheries Exhibition and Congress of Pisciculture in Berlin.

**MUSÉE ROYAL D'HISTOIRE NATURELLE DE BELGIQUE,** Brussels. 8 Vols., "Annals of the Museum," and 8 Atlases.

**SOCIÉTÉ ROYALE MALACOLOLIQUE DE BELGIQUE,** [illegible] Rue du Pont Neuf, Brussels. Publications—"Annals of the Society" (vols. 1 to 17), [illegible] numerous plates of Mollusca. *** This Periodical contains articles on the various [illegible] the construction of aquaria, &c.

**VAN BENEDEN, F. D.,** Rue de Namur, Louvain. A portfolio containing plates of crustaceans, worms, and fish parasites.

**VAN DER BUSCHE, EMILE,** Bruges. History of the Blankenberghe Fishery.

**VLIETINCK, GÉRARD,** 42 Rue Sud du Sablon, Bruges. A work entitled "Gedenkboek der Nij Verheed tentoonstelling van West Vlaanderen," giving description of the fishing utensils employed by the Ostend fishermen; also containing description of the Grand Aquarium at Ostend.


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"LEVE ANTIPLUVIUM" WASSERDICHTEN KLEIDUNGSSTÜCKE,

Welche in allen Klimas brauchbar sind.

Es ist dieses das leichteste Zeug der ganzen Welt für wasserdichte Herrn Röcke und Fischer-Stiefeln.

# CHILI.

(*See Plan, p.* 140.)

## Fisheries.

very extensive Coast of Chili abounds with fish of infinite variety. Her lakes and are also well stocked with trout and *pejereyes*, the latter very delicious and peculiar to . Along a great extent of the coast the sea is usually very calm, and therefore fishing is d on with little difficulty. The boats used for the purpose are generally simply ructed and not remarkable for any peculiar shape. Formerly, a sort of twin-boat called lsa" was very much in use. It was made of seal skins, inflated with air introduced gh a leather or india-rubber tube, and was very well adapted for shores where the sea s roughly, as it was by construction unsinkable. These boats have long ago, however, superseded by wooden ones, much the same as those used in England. The "balsas" ill to be seen in different places along the coast, chifly in the north.

t would be difficult to enumerate the immense variety of excellent fish which are caught e coast of Chili. The kinds most preferred are corbina (a species of white salmon), ndo (flat fish), pescada (Chilian haddock), jerguilla (rock fish), and pichihuen.

The sea around the island of Juan Fernandez is still richer in fish, the amount being gious. Some of the varieties of crabs and lobsters to be found there attain an nse size.

The Chilian fisheries not only produce a plentiful supply of fresh fish for the home con- tion, but there is also a large trade done in dried fish, which is in great demand for the rous trading vessels which constantly arrive at the different ports of the Republic. The and other fish, preserved in tins, are pronounced by many to be unequalled, and the price exceedingly moderate, there is no doubt but that they will shortly be largely exported urope. Bacalao (Rock cod) have been caught at 75 fathoms depth off the Island of Fernandez, weighing 100 lbs.

## Fish Culture.

In Chili there is no establishment of a special character for freshwater pisciculture. Doctor les Segeth, a German medical practitioner, importer of two varieties of the Cyprinis tus, which has become very extensively propagated, and of the Cyprianus Carpio, keeps tter fish in a common pond ever since it was imported into Chili, some years ago, and there ws and breeds, giving hope of their being soon in numbers sufficient to sell for its propa- n all over the country. It does not appear that in the maintenance of this pond its owner used any apparatus for the bringing up of the fish. The same gentleman will soon rt the European astracus fluviatelis. There are salmon ova just arrived in the country, e second time, for putting into the rivers in the southern part of the country, which are well suited for this class of fish.

The Commissioners in Chili for Freshwater Fish, being under the impression that the lon Great International Fisheries Exhibition was one rather of the industrial products of ries than collections for the advancement of scientific knowledge, have only collected and arded specimens of fresh water produce, which on account of their abundance and quality rticles of commerce for the food of the inhabitants to be had in all markets.

## Particulars of the Chilian Whale Fisheries.

Two or three Chilian Companies own fleets of whaling vessels. The general cruising nds of these are in the Pacific Ocean, from the Bay of Panama, latitude 8° north to Chiloe, ude 47° south, and from the west coast to longitude 120° west.

There are also several whaling stations or shore parties at different points on the south of Chili.

The sperm oil obtained is usually shipped to England for a market, but the other oils are ly consumed in the country, principally in the mines or in different manufactories.

### Laws Relating to Fisheries.

The Chilian Civil Code contains, amongst others, the following regulations:—

Art. 611. Fishing in the sea is free to all, but forbidden in the coast waters (*mar territorial) to others than Chilian citizens or domiciled foreigners.

In public rivers and lakes fishing is unrestricted.

Art. 612. Fishermen are allowed to make the beach in the exercise of their craft. They may build huts thereon, stretch and dry their nets, draw their boats and implements ashore, land the produce of their fisheries, &c., but they may not make use of any structure or building on said beach belonging to other parties without the previous permission of the owners thereof, neither may they prevent other fishermen from freely using the beach.

Art. 613. It is likewise permissible for the purposes above mentioned, to make use of the land contiguous to the beach for a distance of eight metres inland, but not of the buildings or structures thereon. It is also forbidden to cross over fences, or to trespass in any plantation, orchard, field, or enclosure there may be there.

Art. 614. The owners of the land contiguous to the beach may, if they please, cultivate said lands, raise fences, buildings, or structures within the aforesaid eight metres, provided they leave adequate and convenient spaces at intervals for the use of the fishermen. If this regulation be not complied with, fishermen can apply to the local authorities for the necessary remedy.

Art. 615. It is unlawful for persons who may fish in lakes or rivers to make use of the buildings or structures on shore, or to trespass on the cultivated lands. They are also forbidden to cross fences.

* * * * * * * * *

Art. 622. Fishing and the chase are in other respects subject to the special regulations that may be issued to meet the circumstances of the case.

It is, therefore, not permissible to shoot or to fish except in places, and seasons, and with the arms or means that may not be forbidden.

### Seal Fisheries.

In consequence of the great development of the seal fisheries in and about the Straits of Magellan, the Chilian Government has lately appointed a Commission to study the question and draw up a report thereon, in order to introduce a law to enforce a close time, and to extend to the waters of those regions the regulation mentioned above in Art. 611 of the Civil Code.

### Whale Fisheries.

The following Article is contained in the Custom House regulations of Chili:—

Art. 14. Whaling ships touching at any of the Ports of the Republic for the purpose of taking in stores or for repairs, are not obliged to present a manifest of the ship's goods, but should they land any article of commerce, they shall be subject to the same regulations as other ships.

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## Division I.

(1) Net of Quilmeja (made from a creeping plant) in use by the Chonos Indians of the Chonos Archipelago. (2) Net for Pejerrey (smelts) small mesh of Net, tanned. (3) Net for Pejerrey (smelts) small mesh of Net, untanned. (4) Casanal or Net for Corbina (white fish Salmonidæ) edged with horsehair rope. (5) Net for Cabinzas (a species of white fish). (6) Trammel for Jerguilla (rock fish). (7) Drag Net of Copo and three side-pieces. (8) Fishing Line with many hooks for 25 fathoms. (9) Fishing Line with many hooks for 50 fathoms. (10) Fishing Line for Pescada (haddock) with four hooks. (11) Fishing Line for Congrios (ling). (12) Fishing Line for Blanquillos (whiting). (13) Harpoon for Corbina (white fish Salmonidæ). (14) Harpoon for Lenguados (flounders).

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* (*Mar territorial.*) These words are thus explained in Article 593 of the Civil Code—"The sea for the distance of one league (legua marina) from the shore, measured from low-water mark, is 'mar territorial,' and forms part of the national dominions, but police supervision extends, in what concerns the security of the country and observance of the fiscal laws, to a distance of four leagues, measured in the same manner."

DIVISION II.

Basket Net for Jaivas (crabs). (2) Basket Net for Morena (black eels). (3) Basket net Camarones (cray fish). (4) Erizeno (fork or pronged pole to detach sea urchins from s). (5) Fish pole, with hook for Peje-Sapo (Sea Tadpole).

DIVISION III.

Two Photographs of Corbina (white fish Salmonidæ) one-third natural size. (2) Two ne Paintings by Chevalier De Martino.

DIVISION IV.

A Fishing Canoe (of Bark) Model, used by Tierra del Fuego Indians with paddle and harpoons. (2) A Twin Fishing Canoe (of leather) inflated, called Balsa, in use by os Indians.

DIVISION XIII.

Two Coloured Nets. (2) Two Red Lines with rows of hooks. (3) Coloured Hoop Net. Two Needles for making nets.

DIVISION XX.

as (Twin Canoes), Collapsible and Portable inflated Skin Canoes, forming raft, or for ng, used by Chonos Indians, Chonos Archipelago.

DIVISION XXV.

dried by the acetic acid of lime process.

DIVISION XXVI.

Centollas (Crabs) Herbstia Condyliata au naturel. (2) Ostras (Oysters), fresh. (3) gas (Mytilus Magellaniæus), fresh. (4) Picos (Barnacles) Balanus Psittacus. (5) osen Miniatura (Mussels in Miniature) Modiola sulcata. (6) Erizos (Sea Urchins) inus esculentus, fresh. (7) Cochayuyo (Sea Wrack) Zostera Marina, stewed. (8) Luche en Seaweed) Ulva Linza, in oil. (9) Choritos (small Mussels), prepared American way. Ostras (Oysters), prepared American way. (11) Ostras (Selected Oysters), fresh. (12) ajuelas (Lithodomus Dactylus), fresh. (13) Piures (Family of Actiniadæ) with hard branous cover, the inner body being only used, fresh. (14) Robalos (Chilian Bream) idæ, in oil. (15) Choros (Mytilus Chilensis), large Mussels, white, fresh. (16) Choros tilus Chilensis), large Mussels, prepared American way. (17) Choros (Mytilus Chilensis), Mussels, prepared American way, black, fresh. (18) Choros (Mytilus Chilensis), large els, prepared American way. (19) Erizos (Sea Urchins) Echinus esculentus, fresh. Robalos (Roe of Chilian Bream), fresh. (21) Locos (Sea Ears) Haliotis Chiliensis. Luche (green Seaweed), in oil. (23) Peyerreyes (Chilian smelts) Osmerus esperlanus, in (24) Tacas (Clampets). (25) Choritos (small mussels) prepared American way. (26) rtment of Fish dried by the bi-acetate of lime process. (27) Piures (Actiniæ) strung ther. This shell-fish is allowed to soak twelve hours before being eaten. (28) Pescada lian Haddock) Gadidæ, dried. (29) Congrio (Ling), dried. (30) Cabrillas (Rock fish) s Cheilodactylus, fried in oil. (31) Rollissos (Torsk) Gadidæ, fried in oil. (32) Corbinas ite fish) Salmonidæ, plain. (33) Pescada (Chilian Haddock), plain. (34) Congrios g), plain. (35) Blanquillos (Whiting), plain. (36) Rayas (Ray Selacienoides) Raia garis, plain. (37) Anguillas (Eels) Acutirostris, in Jelly. (38) Cabinzas (Large broad ines), plain. (39) Chuiquizas, plain. (40) Lenguados (Flounders) Platessa flesus, plain. Langostas (Lobsters) Palinurus Vulgaris, plain. (42) Caracoles (Periwinkles), plain. Blanquillos (Whiting), smoked. (44) Liza (Grey Mullet) Mugil Capito. (45) Bacalao ), dried by the bi-acetate of lime process from Calbuco. (46) Peyerreye (Smelts), dried by bi-acetate of lime process from Calbuco. (47) Congrios (Ling), dried by the bi-acetate of process from Calbuco. (48) Robalos (Chilian Bream), dried by the bi-acetate of lime ss from Calbuco. (49) Dried fish from Taltal. (50) Blanquillos (Whiting, in tins), ked. (51) Lengnados (Flounders, in tins), cooked. (52) Pescada (Haddock), a large

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Beroemd door hunne GEWAST TAFFEN KLEEDINGSTUKKEN in alle Visschersplaatsen van Canada, New Foundland, Zweden, Noorwegen, Holland, Frankrijk en het geheele gebied der Britsche Eilanden.

bale, dried. (53) Vigas. (54) Lizas (Grey Mullet). (55) Pescada (Haddock) whole, dried. (56) Cabrillas (Rock fish) Genus Cheilodactylus, dried. (57) Congrio (Ling), dried. (58) Pureles (Horse Mackerel), dried. (59) Raya Chica (Small Ray), dried. (60) Papahasa, dried. (61) Cangue, dried. (62) Hacha, dried. (63) Peje Perro (Dog fish), dried. (64) Rollizo, dried. (65) Blanquillos (Whiting), dried. (66) Jerguillas, dried. (67) Bagres (Sucker fish), dried. (68) Lenguado (Flounder). (69) Cavinsas. (70) Tollos (Rig). (71) Pejerey (Chilian Smelts) dried by bi-acetate of lime. (72) Snipe Fish. (73) Anguillas (Eels) dried.

## Division XXVIII.

Bi-acetate of Lime process of preserving fish for food.

## Division XXIX.

(1) One flask of Sperm Oil, raw. (2) One flask of Sperm Oil, clarified. (3) One flask of Whale Oil, raw. (4) One flask of Whale Oil, clarified. (5) Sperm Candles. (6) Seal Oil, two flasks from Mejillones del Sur. (8) Tollo (Oil lees), one flask from Mejillones del Sur.

## Division XXXII.

(1) Esponjas (Sponges), from Mejillones del Sur. (2) Cuero de Lobos (Seal Skins, tanned). (3) Cuero de Lobos (Seal Skins), natural state. (4) Gato de Mar (Sea Otter) Lutra Felina. Ornamental Prayer Rug. (5) Chungungo or Gatos de Mar (Sea Otter). From Melinka, Chili. (6) One Lobode dos pelos. (7) One Chungungo. (8) One Chungungo, young. (9) One Coipo. From Juan Fernandez.—(10) Three Lobos de dos pelos. (11) Six Cueroscurtidos de Chungungo. (12) Two Cueros de lobode dos pelos. (13) One Garrote lobero Club for knocking seals on the head. (14) One Cuero de lobo Seal skin de Cuero Bajo. (15) One Espada de peje-espada, Sword of Swordfish. (16) One Corapocho tortugor, or Tortoise back.

## Division XLIII.

Esponjas (Sponges), from Mejillones del Sur.

## Division XLVI.

(1) Conchas de Ostiones (Scollop Shells), Mejillones del Sur. (2) Conchas de Choros (Mussel Shells), Mejillones del Sur. (3) Conchas de Navajuelas. (4) Conchas de Ostras (Oyster Shells). (5) Conchas de Choritos (Small Mussel Shells). (6) Conchas de Choros de Miniatura (Miniature Mussel Shells). (7) Conchas de Choros (Mytilus Chilensis) Shells. (8) Conchas de Locos (Sea Ear Shells). (9) Conchas de Tacas (Clampet Shells). (10) Conchas de Chorito (Mytilus Magellanicus) Shells. (11) Conchas de Pico (Barnacles).

## Division XLVII.

(1) Estrellas de Mar (Starfish). (2) Erizos (Sea Urchin Shells).

## Division XLVIII.

Common Earth Worms used as bait.

## Division XLIX.

(1) Larvæ of a species of xylophagus insect found in decayed trees. (2) Choros (Mussels) Mytilus Fluviatelis, found in streams and canals of clear water and of little currents, which grow the algæ on which they feed. Some water-fowls and some species of water-rats greedily feed on them. Poor people sometimes use them as food in soups, &c. The specimens are of fair average size. (3) Apancoras or Pancoras, Freshwater Shell-fish (Æglea Denticulata) an inhabitant of clear water streams on gravelly beds. Specimens of fair average. (4) Snail (Helix Pommatia). The Common European Land Snail; exhibited only on account of its analogy with its fluvial or lacustrine congeners. Imported casually, perhaps, amongst other plants from France, largely cultivated about Santiago. Within thirty years past it has become so acclimatised, and is so prolific, that in some vineyards it causes such damages that great are taken to destroy it utterly. It is used as food by some of the European residents, and in course of time will be used as bait in fresh-water fishing.

**ANDERSON, ABBOTT, EN ANDERSON,**

**37, Queen Victoria Street, Londen, Engeland,**

Aannemers voor de Levering aan het Britsche Gouvernement, van GEWAST TAFFEN KLEEDINGSTUKKEN, zooals deze worden gedragen voor Onderzeesche Mijnen en Torpedo Werken; ook van hunne Gebreveteerde wel afgewerkte GEWAST TAFFEN KNAPZAKKEN, door hen ingevoerd en voor het gebruik van het Britsche Leger aangenomen.

## Division L.

ngrego Detierra (Cray Fish), Astracus Troglodytes Chilensis; very common in marshes st lands south of latitude 35°. It lives in holes, known by cylinders of clay standing on rface of the soil, apparently serving as entrance, which cylinders are about 15 to 20 centi- in height, 8 to 10 centimetres in diameter outside, and about 2 to 3 centimetres hollow through inside. They appear more fit to admit air to breathe than for entrances. They ught by hand. The exhibits are fair specimens of size. (2) Camaron (Shrimps), s Fluviatilis Chilensis; inhabiting the rivers north of 34° S.; caught by hand or baskets. Shrimps remarkable for the delicate taste of their meat, and much sought for (3) Centollas Armadas (Spider Crabs), from Island of Juan Fernandez. (4) Langostas las (Lobsters). (5) Pampanitos from Juan Fernandez and Carrizal Bajo. (6) Cama- (Prawns). (7) Cangrejos (Cray-fish). (8) Jaivastalicuna (Crab). (9) Jaivas Moradas le Crabs). (10) Jaivas Mora (Crab). (11) Erizos (Sea Urchins). (12) Jaiva Mosos- (Poor Man's Crab). (13) Talicuna Colorada (Red Talicuna Crab). (14) Estrella Sol Star Fish). (15) Señoritas. (16) Quirquncho Espinado. (17) Loco (Sea Ear). (18) . (19) Erizos de Jote (Jote Sea Urchins). (20) Quirqunchos Liso. (21) Poto Verde n Poto). (22) Locos (Sea Ears). (23) Lapas. (24) Chibros. (25) Papañas. (26) hetas. (27) Sierras. (28) Rollisos. (29) Villagallo. (30) Sargo de Jote. (31) sas. (32) Lenguados. (33) Cascujo. (34) Piures. (35) Lenguas de Erizos (Sea Urchin es). (36) Cangrejos de Erizos. (37) Caracolessin Conchas Lapas (without shell). (38) (Sea Ears without shell). (39) Lapas Hegras (Black Lapas without shell). (40) Caracoles tura. (41) Caracoles de Playa (Shore). (42) Choros (Mussels). (43) Sombreritos. Caracoles de Roca. (45) Apretadores. (46) Caracoles de Piedra decojo. (47) Camaron n). (48) Estrellitas (Little Star Fish). (49) Caracol. (50) Redondona. (51) la (Eel). (52) Pichignen. (53) Borrachilos. (54) Peje-Sapo (Frog Fish). (55) pa de piures. (56) Piscos (Barnacles). (57) Jerguillas. (58) Viejas Mondongo. (59) aco. (60) Titia. (61) Estrella (Star Fish). (62) Agua Viva. (63) Peje Angel l Fish). (64) Erizos (Sea Urchins). (65) Erizo de Jote. (66) Locos (Sea Ears). Jaiva Mora. (68) Mora Porchona. (69) Talicuna. (70) Mañegue. (71) Lapas. Chocho. (73) Quircuncho Negro. (74) Quirquncho Espinado. (75) Marisco. (76) . (77) Vejetales Marinos (Marine Flowers). (78) Esponga (Sponge). (79) Huiro. Flor de la Piedra (Flower of the Stone). (81) Luche (Sea Weed). (82) Flor de Piedra e Flower). (83) Lama Verde (Green Lama). (84) Vejetales de Tierra (Sea Shore ation). (85) Chunque. (86) Facsana. (87) Piel de Lobo (Seal Fur Vegetation).

## Division LI.

wo Bacalao (Rock Cod), from Juan Fernandez. Have been caught as heavy as 100 lbs. ight, from 72 to 75 fathoms in depth. (2) Two Corbinas, from Juan Fernandez. ne Corbina, from Chañaral. (4) One Liza (Mugil Liza), from Chañaral. (5) One illa (Aplodactylus), from Juan Fernandez. (6) Dorado (Lichia Albacora). (7) A less Fish. (8) One Tortoise Shell Back. (9)Anguilla (Eel), Ophisurus Remipes, raiso. (10) Culebra de Mar (Mure Nophis Parphyreus), Island of Juan Fernandez. Congrio (Conger Eel), Genypterus Gayi, Ph., Valparaiso. (12) Cabinza (Mendo Tomo descens), from Chañaral. (13) Jurel (Caranx Traclurus) Valparaiso. (14) Two Hachitas letta). (15) Chalaco (Salarias) Viridis Chañaral. (16) Two Pescados Colorados (Red , Serranus Furcifer. (17) Two Cabrillas Listadas (Plectropoma Semicintum), Juan ndez. (18) Aspargate, from Chañaral. (19) Castañeta (Heliases Crusma), from aral. (20) Jurel (Caranx Chilensis), Juan Fernandez. (21) Rollizo (Clinus Variolosus), Chañaral. (22) Jerguilla (Aplodactylus Vernicularis), from Chañaral. (23) Vieja, from aral. (24) Two Cauquen (Atherina), from Constitucion. (25) Two Brecas (Cheilodactylus ichaelis), from Juan Fernandez. (26) Sargo (Pristiponia) from Chañaral. (27) Blan- (Latilus Jugularis), from Chañaral. (28) Pichibueno (Umbrina Ophicephala, from aral. (29) Two Bretolas, from Juan Fernandez. (30) Cephalopoda Onychotenthis, pecimen. (31) Physalia or Portuguese Man of War. (32) Patella and Physurella ole Limpet. (33) Lobster Spawn from Juan Fernandez. (34) Sea Anemones. (35) n of a large Crayfish. (36) Species of Palinurus. (37) Ascidium or Ascidiam. S. P. I.


# ANDERSON, ABBOTT, AND ANDERSON.

**37, Queen Victoria Street, Londres, Angleterre,**

UNIQUES FABRICANTS et FOURNISSEURS de la Police Métropolitaine de Londres de leurs *Collets imperméables*, dont se servent tous les principaux Sergents de ville anglais, irlandais et écossais.

### Freshwater Fish.

(1) Pejerrey (Atherina Lacustrine). (2) Pejerrey (Atherina Fluvialis). The diffe[illegible] between the two varieties is hardly appreciable, consisting chiefly in that the La[illegible] variety has the head somewhat more cylindrical and obtuse than that of the Fluvial, [illegible] head is vertically flatter, and is more pointed towards the mouth. The colour of the La[illegible] variety is perhaps a little darker than that of the other. This fish is abundant in all [illegible] waters. From the Lake of Aculeo, during ten months of the year, there are daily [illegible] about 1000 of them for the markets of Rancagua, Santiago and Valparaiso. (3) Truch[illegible] (Trout), two varieties, the true trout specimens of 35 to 40 centimetres long, and the [illegible] which seldom exceeds 15 to 20 centimetres long. This fish lives in rapid streams; [illegible] always taken by hook and bait; is greedy of the Apancora. (4) Bagre (Trich[illegible] Maculatus), fish inhabiting slow-running streams on muddy bottoms. There is more [illegible] variety of it; that of the exhibit is the most in use as food. It is generally caught with [illegible] baited either with earthworms or with the larvæ of a species of insect found in decayed [illegible]

### Division LII.

Frogs (Calyptocæpalus Gayi), Bactrachians. Very common in slow-running or [illegible] waters. Their colour varies; sometimes it is greenish-black, other times it is black, [illegible] into yellowish red. They are caught by hand or by hooks.

## LOAN COLLECTIONS.

### Collections within the scope of the foregoing Classes.

**SEWELL-GANA, MAJOR.** A Carriage Rug, with three L[illegible] Felina Skins from Chili.

**SEWELL-GANA, MRS.** A Japanese Satsuma (China Dish) [illegible] imitation of the Haliotis shell.

**SEWELL-GANA, MISS.** A Small Collection of Shells, [illegible] from Chili.

**LYNCH, CAPTAIN.** An Oil Painting—Sea Piece, the [illegible] "Esmeralda"; by Chevalier De Martino.

**DE MARTINO, CHEVALIER.** An Oil Painting—Fishing [illegible] and Group of Fishermen and Women, near Valparaiso Harbour.

**SEWELL-GANA, MASTER.** (1) Photograph of part of Valp[illegible] Harbour, Chili, showing part of beach and the boats in common use. (2) Two [illegible] Flower Glasses, ornamented with fish.

**BOARDMAN, MRS.** (1) An Oil Painting—View of Valparaiso [illegible] Harbour from the high road leading to Santiago. (2) An Oil Painting—View of Valp[illegible] Harbour from the Hills behind the Town and looking across the Harbour, with view [illegible] Andes Mountains 25,000 ft. high. (3) A Water-Colour Drawing by C. C. Wood—[illegible] Valparaiso Harbour and Port from the West side. (4) Very Handsome Tortoise-shell [illegible] worn by ladies thirty-five years ago. (5) A Handsome Shell carved with Chinese figures [illegible] Canton. (6) Canoe—Model of, in bark, in use by Tierra del Fuego Indians, with paddle-[illegible] harpoons. (7) Fish Baskets. (8) Physical Atlas of Chili, with plates. (9) Two [illegible] Photographs of Valparaiso and Harbour, lent by James Whitehead, Esq., Guaton, Torquay.

**ANDERSON, ABBOTT, AND ANDERSON,**
37, QUEEN VICTORIA STREET, LONDON, ENGLAND:
*Largest Manufacturers in the World of the*
BEST OILSKIN CLOTHING.
Prize Medals from all International Exhibitions.

# CHINA.

(*See Plan, p.* 140.)

ollowing particulars are taken from the official Yellow Book—No. 11, Miscellaneous Imperial Maritime Customs, China—which contains the special catalogue of the Chinese ion. The Chinese Government placed the matter in the hands of Sir Robert Hart, .G., Inspector-General of Customs; and, under his directions, an Exhibit intended to te the Swatow Fisheries, supplemented by some interesting objects from Ichang, Ningpo, kow, has been provided.

*ow* is situated at the north-eastern corner of the province of Kwangtung in latitude 23° N. and longitude 116° 39′ 3″ E., near the frontier of Fukien. The river Han flows past , and joins the sea, after many ramifications, a few miles below the town.

he district of Swatow, T'at'oupu and Haimĕn on the mainland, and the Island of facing a mouth of the river, are the most noteworthy stations for deep-sea fishing. leets belonging to these places are daily engaged in exploring the waters.

estrictions are laid on the fishing grounds on the part of the Government, and fishing is on all the year round. All boats must be registered at the port to which they belong, ious fees, depending on the size of the boats, are collected by the authorities from ermen ere they are allowed to put to sea. The licences issued generally hold good years. At each of the above-mentioned places the division of the boats and the ition of the profits are different. The crews are always interested in the outturn of the There are no benefit societies of any kind where the fishermen might ensure their lives de for cases of accident, nor are there assurance societies where the boats and gear might red against the dangers and risks of the sea.

number of fishermen of the Swatow district is estimated at 12,500, but it is probable is figure is far below the actual number.

ish trade of Swatow is not very important as regards exports to Hongkong and native Cuttlefish and dried fish alone have gained attention hitherto. The principal buyers of he marts of T'at'oupu and Haimĕn are the inland districts.

cuttlefish the season extends from March to September, but during the months of uly, and August, the haul is generally most abundant.

stake nets are largely used in this district, near Namoa particularly, where there are the fishing stakes in China.

mall fish the Chinese use silk nets, which are very strong and durable.

ing for broken shells at the mouth of the river Han forms a considerable industry. eing no limestone found in the districts adjoining the sea-shore, shells are burnt into d about 350 boats of a carrying capacity, varying between two and three tons, are tly engaged in this trade.

e upper region of the river Han the fish are caught by strewing poisonous substances on er; the river being so well stocked with fish no objection is raised by the authorities to ocess. For the same reason pisciculture has not received much attention in this , but the system of fishponds is worthy of notice.

*g* is situated on the Yangtsze, nearly in the centre of China, at a distance of 1000 miles e sea. The fishing divides itself into three kinds:—

Fishing in the river itself.

Fishing in the numerous mountain streams which fall into the Yantsze.

Fishing in the shallow lakes and large ponds which abound in close proximity to n.

ng with the live otter is perhaps entirely peculiar to this immediate neighbourhood.

*po.*—The city of Ningpo stands on the river Yung, twelve miles from the sea, in latitude N. and longitude 121° 22′ E., about 90 miles south of Shanghai. It is the point of ence of an extensive river and canal system, and at the same time occupies a commanding with reference to the well-known Chusan Archipelago. Partly owing to the wealth arprising character of its population, and partly to its favourable situation, Ningpo is e most celebrated places in China for the extent and variety of its fishing industries.

*e, Formosa.*—The objects catalogued under this heading were gathered from so many esides Takow *itself, viz., Anping,* Lambay Island, the Pescadores Islands and the

South Cape, that, while termed for brevity's sake the Takow collection they may be as representing the fisheries of South Formosa and the Formosa Channel.

The island of Formosa is politically a part of the Chinese province of Fukien, from is separated by the stormy Formosa Channel some 100 miles wide. It lies between and 25th parallels of north latitude, and in east longitude between the 120th a meridians.

Takow was opened to foreign trade in 1863. It is thirty miles south of Taiwan was opened by the stipulations of the treaties of 1858. Anping is on the miles west of Taiwanfu, the Pescadores Islands are a group of twenty-one island Formosa Channel, about twenty-five miles west of Formosa. Lambay Island lie distance off the mainland, twelve miles south of Takow, and the South Cape is the southerly point of Formosa.

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[For explanatory details, of the Chinese collection, and of the decorations of the Ch Court, see Official Yellow Book, obtainable in Chinese Court.]

## SWATOW.

### Division I.

(1) Trawl Net. (2) Small Trawl Net. (3) Large Seine Net. (4) Small Sei (5, 6) Bag Nets. (7) Seine Net. (8) Casting Net. (9) Stake Net. (10–12) O Nets. (13) Shellfish Net. (14) Large Flat Net. (15) Sluice Net. (16) Shri (17–22) Shrimp Net. (23) Shrimp Net. (24) Small Scoop Net. (25) Shell N Cockle Net. (27–31) Small Flat Dip Nets. (32) Hemp Net. (36) Spinning (38) Hemp-string. (39) Various bands of the Casting Net. (40) Stove and Tub f and steaming the nets. (41) Mangrove Bark. (42) Shuttles. (43) Hooks. (44 for Cuttlefish. (45) Hook Baskets. (46) Hooks and Lines. (47) Silk Fis (48) Fish Spears. (49) Eel Spears. (50) Eel Hook. (51) Fish Rake. (52) H taking Sharks or Dog-fish. (73) Fish Baskets. (75) Shell Baskets. (123) Dry (124) Large Dip Net. (125) Salt Pans.

### Division II.

(53) Fish Traps. (54) Dredger for Shells. (57) Shrimp Trap. (58) Eel Trap. ( Traps. (60) Fish Traps for small fish. (62) Shovel. (74) Shrimp Basket.

### Division IV.

Models*:—(78–80) Fishing Boats. (81–82) Two Boats with Trawl Net. (83 Boat and Bamboo Raft. (84) Bamboo Raft. (85) Boat for Dip Net Fishing. ( Boats for Night Fishing. (87) Boat. (88–89) Two Boats with Seine. (90) Nam Fleet. (92) Boats for Seine Fishing. (97) Sampan. (98) Tic-à-tac. (99) Coc Boat. (100) Boat for Shell-fishing. (101) Crab Boat. (102) Mandarin Boat. ( Cargo Junks.† (113) Cargo Boats.† (114) Mandarin Boat.† (121) Paper Boa

### Division V.

(69) Ropes. (70) Bamboo Rope covered with straw.

### Division VI.

(68) Compass. (71) Oars. (72) Lanterns. (76) Anchors. (77) Scoops.

### Division IX.

(1) Model of Breakerpoint Lighthouse. (2) List of Lights on the Coast of C Charts showing the lights erected on the Chinese Coast since 1863.

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* Unless specially stated to the contrary, it should be understood that the models of the boats are all b ¼ in. to the foot.

† These Exhibits are models of boats seen on the Swatow River.

THOMAS BLAND & SONS,

Gun and Rifle Manufacturers and Merchants,

106, STRAND, LONDON;

AND LIVERPOOL AND BIRMINGHAM

DIVISION XXI.

cles of Dress used by Fishermen.

DIVISION XXIII.

Fisherman's Hut. Models:—(19) Fishermen's Guildhall at Haimên. (20) Fishermen's le.

DIVISION XXV.

ove for Curing Fish, with all the necessary implements. (2) Baskets used in curing (3) Fish Knives.

DIVISION XXVI.

nd Salted Fish.

DIVISION XXVII.

Dried Shark's Fins. (28) Ditto Whitebait.

DIVISION XXXII.

Dried Seaweed. (34) Window in which Shells take the place of Glass. (35) Fog made of a Shell. (36) Ash-cellars made of Shells. (37) Necklaces made of Shells. Scoops made of the Shells of the King Crab and of other shells. (40) Lanterns made of the Skin of the Tetrodon. (41) Tobacco Pipes decorated with shark skin. (42) boo Trays for the display of Fish in Fishmongers' Shops. (43) Bamboo Baskets for , used by Fishmongers.

DIVISION XXXV.

ls:—(63) Fish Stakes. (64) Fish Weir. (67) Sluices with Nets. (1) An Oyster (65) Mats. (66) Mud Sledge. (2) Oystermen's Tools.

CLASS V.

[See Special Catalogue.]

DIVISION LX.

**eports, statistics and literature of fish, fishing, and fisheries.**

ap of Chinese Empire. (3) British Admiralty Maps. (4) Missionary Map of the y round Swatow. (5) "La Pisciculture et la Pêche en Chine," par M. Dabry de nt. (6) "Special Catalogue of the Ningpo Collection of Exhibits for the International y Exhibition, Berlin, 1880." (7) "Reports on Trade at the Treaty Ports for the 1880." See especially, "Notes on Oyster Culture and Fishing," by W. B. Russell, Esq., 4 and 206.

## ICHANG.

DIVISION I.

Line, Hooks, and Bell. (4) Model of Sweep Net.

DIVISION IV.

del of Boats:—(1) With Cast (or Bell) Net and Otter. (2) With Dip Net and Trap hed.

DIVISION XVI.

Coarse Fishing Rod, with Reel and Spinning Bait. (6) Basket, Rope and Creel.

DIVISION XVII.

Eel and Fish Traps and Shrimp Net.

DIVISION LVII.

Model of Boy fishing with Bamboo Spring Hooks.

ARMY REGULATION
WATERPROOF.
ANDERSON, ABBOTT, AND ANDERSON'S
WATERPROOF.
GROUND SHEETS.

## NINGPO.

### Division IV.

Models*:—(1) Cuttle Fish Boat. (2) Ice-carrying Boat. (3) Boat for Night Fishing. Small Boat with Passenger. (5) Bamboo Raft for Shallow Water. (6) Cormorant Boat, f size, with cormorants and fisherman. (7) Boat with Flat Net. (8) Foot Boat. (9) Vari Flags used by Fishermen. (10) Weathercocks used on Chinese Boats.

### Division XXIII.

(1) Model. An Ice House.

### Division XXXII.

(2) Window made of Oyster shell. (1) Specimens of Shells with images inside. (3) "Bell Shells."

### Division XXXV.

(1) Specimens of Oyster-shells from T'aichow, in the Chêhkiang province.

### Division LVII.

Models:—(6) Chinese Fisherman. (1) Mandarin. (2) Gentleman. (3) Woman of t middle class. (4) Soldier. (5) Bride. (6) Boy. (7) Girl. (8) Idol. (9) Hang Scrolls with Mottoes and Rubbings of Chinese Inscriptions.

## FORMOSA.

### Division I.

Takow.—(1-2) Two Bag Nets. (3) Casting Net. (4) Beach Net.
South Cape.—(5-6) Two Casting Nets. (7) Fish Nets. (8) Pushing Net. (9) B and Arrows. (10) Fishing Rods and Lines. (11) Fishing Lines. (12) Fish B (13) Fish Baskets.
Lambay Island.—(14) Hand Net.
Anping.—(16-21) Six Models. Catamarans. (22) One Model. Country Fishing Raft w Net. (23) Two Ditto. Fishing Junks. (26) Model Trawls, large mesh. (27) Two, w small meshes. (28-30) Three Models. Bag Nets. (31) Casting Net, full size. Ground Net, full size. (33) Fish Spawn Net, full size. (34, 35) Two Pushing Nets, f size. (38) Treading Baskets, full size. (39) Loach Traps, full size. (42) Fish Bas (43) Clam Dredger, full size. (44) Clam Digger. (45) Eel Spear. (46) Loach H and Rod. (47) Fishing Rod and Hooks. (48) Shark Hook. (49) Net Hook.

### Division II.

Anping.—(25) Prawn Dredger, full size. (36) Shrimp Net, full size. (37) Crab Net, f size. (40) Crab Traps. (41) Crab Catcher.

### Division VI.

(1) Fog Horns.

### Division XXXII.

(2) Spoons. (3) Rings. (4) Wine Cups. (5) Head Ornaments. (6) Paper Weights. ( A Pipe made of Shell.

### Division XXXV.

(1) Rock Oysters. (2) Bamboo Oysters.

## CLASS V.

## NATURAL HISTORY.

[See Special Catalogue.]

* The models exhibited are made to scale.

ANDERSON, ABBOTT, AND ANDERSON'S
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WORKS: LIMEHOUSE, E.

# DENMARK.

(*See Plan, p.* 176.)

## A. Denmark Proper.

most important of the *fisheries in the open sea* are the following:—1. The fishery of had- cod, and flat fishes, carried on in the North Sea and the Skagerak at a distance of eighteen enty-two English miles from the coast of Jutland, by means of long lines.* The proceeds s was estimated in 1879 at 1,378,000 crowns, but must be supposed to have increased since. he hook-fishery of salmon in the Baltic, carried on from Bornholm and Christianso, of the total proceeds were estimated in 1879 at 507,800 crowns. 3. The fishery of herrings ans of drifting nets † in the Great Belt, the Kattegat, and in the Baltic from Bornholm. value of the autumn fishery of herrings in the Kattegat and the Great Belt is estimated 50,000 crowns. The most important *Coast Fishery outside the Fjords* of the Baltic the Kattegat, in the Belts and the Sound, has for its object the so-called "Blanke Aal," ety of the common eel (*Anguilla migratoria*, Kr.). This fishery is carried on by means legaarde,‡ Slæbevaad,§ Pulsvaad,‖ Snurrevaad,¶ hooks, boxes, eel-spears, &c., and the l proceeds are estimated at 1,600,000 crowns. Besides this a certain quantity of spring- ng, cod, and gar-fish are taken by means of Bundgarn.** The *Fishery in the Fjords* or w inlets from the sea, which are so numerous in Denmark, comprises, besides salt-water s, several fish properly belonging to fresh water, such as pike and perch, the water of the s being in many places brackish. The value of this fishery upon the whole cannot be ted with any accuracy. Special mention must be made of the Limfjord which separates orthernmost portion of Jutland from the main portion. Since 1826, when a channel rmed between the North Sea and the head of the Limfjord, the latter has become lly a Sound, and the fishery has in part become a salt-water fishery. Eels are taken y means of eel-spears of various constructions, nets, hooks, and weels; herrings by of Vaad †† and Bundgarn; cod are caught in nets and with hooks; flat fish are taken d or Nedgarn ‡‡; lobsters too are fished for here. The value of this fishery was put down nting to 450,000 crowns in 1881. Besides this, two millions of oysters are taken y, to a value of 300,000 crowns. The *Fresh-water Fishery* of Denmark is of no great nce on account of the small extent of lakes and rivers. The species of fish are usually occurring in that latitude. The whole value may be taken to be about 150,000 , of which about 60,000 crowns' worth are exported to Germany. The total annual value fisheries in Denmark proper may be estimated at about 5,500,000 crowns, of which 000 crowns represent the export to other countries, 2,000,000 crowns the value of the old in Denmark, and 1,200,000 crowns the consumption of the fishing population itself. number of families living principally by fishery is about 4,300; 7,000 families derive diary income from fishing. In all, 11,300 families are connected with this industry. umber of boats employed having decks or wells is about 1,000, besides from 4,000 to open boats. The tonnage of these crafts cannot be stated. The fish exported consists

The Danish term rendered "long line" is "Bakke." The implement consists in a long line to which shorter re attached at certain intervals; these latter (which are called "snoods" in English) being furnished ited hooks and terminal floats. The term "trawl" was originally used for this implement, and is still in parts; but is not used here because it seems that "trawl" now generally means "trawl net"—a net along the sea-bottom and kept down by weights.

Drifting nets" stands for "Drivegarn"—nets floating near the surface, or at any rate not fixed or kept ar the bottom.

Aalegaard" means a set of weels.

Slæbevaad" is a net dragged along the bottom, but not so heavy as a trawl net.

Pulsvaad" is a net into which the fish is driven after the net has been conveniently fixed, by beating the of the water with a peculiar club-shaped wooden instrument, of which the broader end is excavated a The instrument is driven down against the water with the excavated end foremost. The noise produced heard at a great distance, and frightens the fish into the net.

Snurrevaad" is a net of which one end is firmly fixed by means of an anchor, the boat being worked up to the

Bundgarn" means a net sunk so as to intercept the fish moving along the sea bottom.

Vaad" means a fishing-net generally, but especially a net which is thrown out from a boat or near the shore n dragged in.

Nedgarn" is a net which does not reach so far down as a "Bundgarn."

mainly of haddock, flat-fish, salmon, oysters, herrings and eels, the two last kinds either fresh or smoked. By far the greater portion goes to Germany, a smaller portion to Sweden. The fish is conveyed by rail, steamers, or boats with wells.

B. Iceland.—The proceeds of the cod-fishery in 1882 was estimated at 20,000,000 lbs. and the value at 4,000,000 crowns. The fish is cured in two ways; the so-called "Klipfisk" is exported mostly to the south of Europe, whilst the so-called "Platfisk" or "Saltfisk" forms the principal article of food of the inhabitants. The herring fishery produced last year about 50,000 barrels, value 1,300,000 crowns. Another important branch of fishery in Iceland is that of the Hákal, or Greenland shark (*S. borealis*, Scoresb.), of which the liver yields a great quantity of oil.

C. The Farö Islands.—The fishery is of the same description as that of Iceland, and the proceeds in 1882 were stated to be 4,000,000 lbs. of fish, worth 800,000 crowns. In some years a considerable revenue is derived from the capture of pilot whales (*D. globiceps*), large shoals numbering sometimes as many as 2,000, being occasionally driven on shore and killed.

D. Greenland.—The native population of Greenland, which on the 1st of January, 1882, amounted to 9,752 individuals, subsist entirely on the chase of marine mammalia and birds and on fishery. 2,100 kajaks, 2,400 nets, 250 large boats, and 270 sledges, with their complement of dogs, are employed, and the annual take may be estimated at 90,000 seals, 15,000 sharks, besides a quantity of small whales, salmon trout, halibut, and cod.

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Division I.

**HOLST, ALR.**, Skagen. (1) Fishing Nets. (2) Model of Boat.

**BAGH, FISHERMAN**, Skagen. (1) Flounder Nets. (2) Cod Lines.

Division II.

**DAVIDSEN, SOLOMON**, Copenhagen. (1) Samples of train oil, Fish Bladders, Eider Down. (2) Eider Down Quilts. (3) Whalebones. (4) Woollen Stockings, Socks, Gloves and Jackets. (5) Models of Greenland Boats.

**MÜLLER, ALON**, Thorshavn, Faroe Islands. (1) Model of Whaling Boat. (2) Preparations in spirits. (3) Sea Plants. (4) Dress of Sealskin. (5) Whale Knife.

**BONNESEN, CAPT.**, R.D.N., Copenhagen. Model of Boat with sinking centre keel.

**FEDDERSEN, ARTHUR**, Viborg. (1) Model of a Boat. (2) Fishing Net. (3) Printed Matters.

**DANISH GOVERNMENT TRADING DEPARTMENT FOR GREENLAND**, Copenhagen. (1) Boats and Models. (2) Eider duck, fox, bear and sealskins. (3) Narwhale tusks and Walrus tusks. (4) Seal Oil. (5) Graphit. (6) Seal skin Clothing. (7) Whalebone. (8) Harpoons.

**CLAUSEN BROS.**, Holbeck. Box and Net for hatching of live fish spawn.

Division IX.

**KLIXHÜLL, SOPHUS**, Lieut. R.D.N., Copenhagen. (1) Non sinking travelling bags for passengers. (2) Life Buoys. (3) Life Belts for anglers and yachtsmen. (4) Waistcoats for fisher and lifeboat men. (5) Cushions of different patterns.

Division XXI.

**LETH, C. A.**, Copenhagen. Iceland hand-knitted Woollen Goods.

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ANDERSON, ABBOTT & ANDERSON'S
PATENT HYGIENIC VENTILATED
WATERPROOF COATS.
37, Queen Victoria St., London, England.

DIVISION XXIII.

**DOECKER PORTABLE HOUSE FACTORY,** Copenhagen
ral Agents for abroad, Puggaard and Galschiot, 50 Bd. Haussmann, Paris. Portable
ctures made of light wooden frames covered with a special kind of felt, perfectly water-
f and non-conductive of heat, used largely for fishing- and shooting-boxes, quarantine
es, &c.

DIVISION XXVI.

**PETERSEN, JOH.,** Copenhagen. 1 Case containing Dried Fish.

DIVISION XXIX.

**HOFFGAARD, G. F.,** Vice-Consul for Denmark, Manchester.
les of Seal and Seacalf Oil.

DIVISION LV.

**THE ADMIRALTY,** Copenhagen. Charts.

## DANISH METEOROLOGICAL INSTITUTE.

[This Exhibit is placed under 389, Great Britain, Division ix.]

NSTRUMENTS. *a. Thermometers.* (1) Thermometer for measuring the temperature of the
ce of the sea. (2) Isolated Thermometer (in ebonite) for deep-sea temperature (con-
ted by Steger, Kiel). (3) Isolated Thermometer (in cork) for deep-sea temperature (con-
ted by Rung, Copenhagen). (4) Revolving Apparatus, with Negretti and Zambra's
-sea Thermometer (Rung). (5) Rotation Polychrometers (Hoffmeyer and Rung). *b. Water-*
*s*—(1) Water-bottle (Ardwidsson, Stockholm). (2) Water-bottle (Rung, Copenhagen).
Weight, to be separated in two (Rung, Copenhagen). *c. Hydrometers*—Case with six
rometers and one Thermometer. *d. Anemometers*—(1) Stationary Anemometer (Hagemann,
enhagen). (2) Portable Anemometer (Hagemann and Rung).
B. CHARTS. (1) Chart of Denmark Nautical Service, Meteorological Stations (lighthouses,
-vessels, revenue cutters). (2) Chart of Denmark Weather Service. Stations supplied
daily weather forecasts. (3) Chart of the North Atlantic, with number of observations,
tered from ship's logs.
C. MODE OF PUBLISHING DAILY WEATHER CHARTS. (1) Hectographic Weather Charts. (2)
ther Charts in Newspapers (Rung's Method). (3) Copy of "Nationaltidende." (4) Matrix
aper, for the Victoria Press. (5) Weather Chart in stereotype, ditto.
D. PUBLICATIONS, INSTRUCTIONS, ETC. Annual Reports, Instructions for Regular and
ional Observers, Schedules, &c.

**FEDDERSEN, ARTHUR,** Viborg, Denmark. (1) "Fiskeritidendi,"
kly paper for sea, and other fisheries. (2) The Danish Sea Fisheries. (3) Freshwater
g. (4) Fish culture. (5) On fishponds and other treatises. (Silver medal for publica-
on fishing, Berlin, 1880). (6) Fisherboat (Model) from Westjutland.

**MORCH, CARL,** Fisherman, Sæby, Denmark. (1) Net for plaice-
g. (2) "Bakke" (see introduction of Cat).

**DEBELL, LAUR,** Copenhagen, Denmark. (1) Anchovies. (2)
ings without bones.

**FIEDLER, HARALD,** Skjelskör, Denmark. Charts and Books.

**BRANDT, MARTIN,** Ringkjöbing, Denmark. Tinned Fish.

**SEIDELIN, S.,** Copenhagen. Hand-knitted Woollen Fisherman's
rel. Faroe make.

**JESTRUP, E., & CO.,** Copenhagen. Waterproof Leather Jackets.

**VINTER,** Fisherman, Skagen. Seine.

**BAKKER,** Fisherman, Skagen. Cod Lines.

**BRINCKMANN & CO.,** Copenhagen. Eiderdown Quilts.

**ANDERSON, ABBOTT, & ANDERSON,**

**37, Queen Victoria Street, London, England,**

Berühmt in Canada, Australien, Neu-Seeland, Cap der guten Hoffnung, Natal, Indien, China, als die einzigen zuverlässigen Fabrikanten von OELHAEUTEN, welche zur Verschiffung verpackt am Bestimmungsort in wohl behaltenem und verkäuflichem Zustande anlangen.

it that the State recruits crews for its men-of-war. The fishermen are included in the Maritime Inscription after having been engaged afloat at two years or less.

In 1881, which is the date of the last statistics compiled by the Depar 80,875 sailors, manning 22,125 ships and smacks, with a tonnage of 14 employed in fishing: besides which, 55,485 riparians (men, women, and ch fishing on the banks.

The figures above quoted comprise not only the fisheries of the French cod-fishing off Newfoundland, Iceland, and the Dogger Bank, as well as herri fishing on the coasts of Scotland, England, and Ireland.

Taken as a whole, the year 1881 was not so productive as the year pre in fact, the value of the produce captured reached the sum of 86,917,668 82,670,058f. was valued.

The diminution, 4,247,610f., may be traced exclusively to the sardine from which the returns show, as compared with the year 1880, a falling c francs.

The Newfoundland cod-fishery was prosecuted in 1881 by 137 vessels, sailors, who captured 17,683.289 kilogrammes of fish, realising 7,882,255 franc

In Iceland the same fishery employed 202 vessels and 3436 men. The 9,695,411 kilogrammes, selling for 5,876,607 francs.

The herring fishery was very successful during the season of 1881, 39,101, of this fish, valued at 9,055,352 francs, having been captured on the coasts of S and France. It would have been more prolific still had it not been marred which inflicted losses both of men and effects on several vessels.

The fisheries for fresh fish, which comprise turbots, brill, soles, plaice gurnets, mullets, whiting, congers, salmon, lampreys, sturgeons, etc., were car sailors, manning 21,786 smacks,* and the take was 49,940,026 kilogrammes 32,216,487 francs.

374,985,770 oysters were dredged during the season 1880-81 (*i.e.* betwe 1880, and 15th June, 1881). These fetched 2,061,753 francs. The *total* n disposed of during the same period amounted to 680,372,750, and the money to 17,951,114 francs. This total includes those fished from the sea and tho

e Fund for Disabled Sailors awards help to the families of those who are lost at sea, and the different ports along the coast there exist benefit societies for fishermen.

In France the maritime fishery is regulated in such a manner as to secure to sailors the ee exercise of their calling, awarding to them at the same time financial protection when elp of this kind can be usefully given.

### Notes and Data concerning Sea-Fishing at Boulogne-sur-Mer.

Official documents issued annually by the French Government prove that the Boulogne rt and fishing station ranks as No. 1 in the comparative series of the 61 districts into which e sea-coast of France has been divided for administrative purposes.

According to the latest statistics published, the Sea Fisheries for the whole Republic in 81 gave employment to 80,875 men on board 22,125 ships and boats, of 149,297 tons ggregate burden, resulting in sales of fish to the amount of 82,678,058 fr., or close upon ree million and a quarter pounds sterling.

In this grand total the share credited to Boulogne station is entered at 10,439,605 fr., or er £416,000, which represents nearly one-eighth of the total produce of French Fisheries.

Next after Boulogne, with regard to the amounts realized, come Fécamp with 5,342,687 fr.; unkirk, with 4,521,748 fr.; and Honfleur, with 2,285,425 fr.; then Douarnenez, with 654,609 fr.; St. Malo, with 2,625,718 fr.; and St. Brieuc, with 2,562,660 fr.; none of the her Ocean, Channel, or Mediterranean fishing stations realized £100,000 for that year's oduce.

Deep-sea fishing operations are carried on at Boulogne by a flotilla of ships and boats, nned by crews of 18 to 22, including two or three apprentices or boys. The yearly earnings the fishermen, whether they share in the profits of each venture when working upon the rtnership system, or are paid by fixed wages, average 1500 fr., or £60.

The boats, which for the largest proportion are luggers, have for the last 10 years been pplied with small steam-engines working a capstan used in raising the nets, hoisting the ils, taking up and setting the masts, and landing fish or barrels. Experiments were also ied for a few years with screw-propellers; but these have almost universally been discarded, use the engine, shaft, and coal-bunkers took up too much of the available space, and the ew itself fouled and damaged the nets and gear.

The fishing trade in Boulogne is concerned with every branch of Sea Fisheries;—cod, ring, mackerel, and "*La marée fraiche*," which includes every description of fresh table-fish.

The ships used in the cod-fisheries range between 100 and 150 tons. Until quite recent es they proceeded both to Iceland and the Dogger Bank; but Iceland has only been ited to of late years by one or two ships, whereas a large increase is to be noticed in the mber of those working the Dogger Bank grounds: thus, in 1882, 59 ships were fitted out, their operations yielded 574,000 fr. out of a total sum of 598,652 fr. realized by all od-fishing boats in the district. The Dogger Bank is preferred before Iceland, because men can carry on what is styled *mixed Fishing* (*La Pêche mixte*), namely, both cod and ring at the same time.

Herring is the main stay of the trade; in fact it realized in 1882 a total sum of 8,944 fr., as shown by the sales effected in the Fish Exchange. The introduction of cotton , in lieu of twine nets, has resulted in larger catches of fish, and their use now is all but ersal for herring drifting, although they nearly all are English made. In two or three ch ports cotton fishing-net factories have been established; but even these must procure r cotton from England.

Mackerel are caught off the south coast of Ireland, and salted on board at once. This is a recent branch of the Boulogne deep-sea fishing ventures, being first started about the 1868. It was carried on in the 1882 campaign by 52 boats manned by 966 fishermen, their catches, exclusive of mackerel kept in ice and landed at Boulogne, sold for 425,227 fr., ly at Fécamp, which is the recognized market for that description of *salaison*, all mpts made to establish a trade for salt mackerel at Boulogne having met with indifferent ess.

Fresh table fish, usually called *La Marée fraiche*, give employment all the year round to

two kinds of craft; (1) small undecked boats hailing from little ports in the district, Berck, Cucq, Etaples, Equihen, Le Portel, Ambleteuse, Audresselles, &c., which are worked chiefly by superannuated seamen and by apprentices; (2) the larger decked boats, after they have returned from their deep-sea fishing ventures, and as a sort of aftermath. Both the large and the small number about 300, of nearly 4000 tons, manned by 1800 hands. They brought into the market in 1882 fresh fish of a total value of 4,097,592 fr.

To the various items above must be added a sum of 179,505 fr. as the value of in-shore fishing, including shrimping, mussel-gathering, crab-catching, &c., which, considering that it frequently does not require the use of boats, bears the official name of *Pêche à pied*, because it is practised by old men, women and youths on foot.

The French fisheries are occasionally supplemented by imports from abroad, Great Britain being the only country which brought up fish into France *viâ* Boulogne. Thus, in 1881, 170,535 kilog. of fresh herring and 1,255,313 kilog. of other fresh fish were landed and passed from England, besides 3564 kilog. of smoke-cured herring, and 3416 kilog. of sundry kinds of wet-cured fish.

The most sedulous attention and care have of late years been brought by the Boulogne fish merchants and curers to bear upon the various modes of preparing fish for the home and foreign markets, whether curing operations were conducted on board their boats afloat or in their town establishments. They thus have secured new outlets for their produce, not only throughout France and in conterminous countries, such as Switzerland and Italy, but in far more distant regions, for instance, the Baltic provinces and the United States of America: they even have established a remunerative trade in England itself, and in Ireland.

Sea fishing is beyond contest the prime and most precious industry of the Boulogne district, inasmuch as numberless trades, callings, professions, and industries are dependent upon it to such an extent as to swell the total returns of the operations connected with sea fisheries in the station to one million pounds sterling a year.

Neither is this the sudden result of adventitious inflation; it must be held as the steady regular development of an ancient condition of things, which from small beginnings has culminated to this brilliant climax. Going no further back than the year 1821, it is on record that fishing operations realized 1,287,712 fr.; they nearly doubled their returns within the next decade, yielding 2,211,675 fr. in 1830, and then 2,500,000 fr. in 1843; in 1868 they sprang up to 7,091,724 fr., and advanced to 9,668,827 fr. in the decade following; they now stand at 10,439,605 fr. for 1882.

The chief causes which have thus made Boulogne the largest, foremost and most prosperous fishing station in France, may be stated briefly in the manifold improvements systematically adopted by the fish merchants and shipowners of the district, which concerned both the size, lines and rigs of the boats and the nets, in the introduction of steam power, and in the new markets opening abroad year after year for produce of a higher character.

Dredging operations, which have now been persevered in for more than a twelvemonth at the mouth of the harbour, with a view to clear away the sand bar which obstructed it, and sundry other operations not yet fully completed in the fairway, have already resulted in opening the harbour to the fishing flotilla, and to a large portion of merchant ships, for 17 hours daily out of the 24.

There is a sure promise held out and on the eve of realization, that within a few months the harbour of Boulogne, frequently but unjustly reckoned as a mere fishing port, will be made accessible all day long, and without let or hindrance, not to fishing ships and boats alone, but also to the large merchantmen, both sailers and steamers, which usually resort to its wet dock for the purpose of taking up or discharging their cargoes. So, even before that grand undertaking, the deep-sea harbour, now constructing in the west of the present tidal harbour, is ready to receive the shipping, free access to and exit from the present harbour and docks of Boulogne, regardless of the state of the tide, will be secured and realized.

Among the various items contemplated and prepared in connection with that scheme of an ocean harbour intended to supersede the present tidal harbour, special landing quays and stages have been devised for the fishing flotilla which has placed and maintains Boulogne at the head of the whole list of the fishing stations in France.

| ESTABLISHMENTS. | NUMBER. | | | | AREA. | | | | KEPT. | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | Public Domains. | | Private Property. | | Public Domains. | | Private Property. | | By enrolled mariners, their wives and children. | | | | By persons not enrolled. | | | |
| | | | | | | | | | Public Domains. | | Private Property. | | Public Domains. | | Private Property. | |
| | 1880. | 1881. | 1880. | 1881. | 1880. | 1881. | 1880. | 1881. | 1880. | 1881. | 1880. | 1881. | 1880. | 1881. | 1880. | 1881. |
| | | | | | hect. a. c. | hect. a. c. | hect. a. c. | hect. a. c. | | | | | | | | |
| Fishery establishments in permanent structures . | 924 | 935 | — | — | 1487 47 61 | 1491 12 41 | — | — | 578 | 580 | — | — | 3341 | 3353 | — | — |
| Establishments for net fishing . . . . . | 1154 | 1175 | — | — | 106 18 0 | 108 28 00 | — | — | 611 | 615 | — | — | 453 | 468 | — | — |
| Parks, beds, and preserves for oysters . . . . | 30,591 | 32,364 | 957 | 970 | 7734 03 69 | 8050 39 66 | 368 60 76 | 375 69 83 | 10,116 | 10,706 | 115 | 118 | 17,293 | 17,841 | 755 | 766 |
| Mussel beds . . . . . | 5356 | 5568 | — | — | 1243 50 00 | 1264 70 00 | — | — | 2325 | 2338 | — | — | 2593 | 2610 | — | — |
| Parks or depots for Mussels | 805 | 836 | 18 | 18 | 136 45 35 | 140 54 98 | 3 60 00 | 3 60 00 | 1356 | 1376 | — | — | 2194 | 2205 | 18 | 18 |
| Tanks or preserves for Crustaceans . . . . . | 83 | 92 | 1 | 1 | 3 76 60 | 12 36 82 | 3 24 | 3 24 | 32 | 36 | — | — | 26 | 29 | 1 | 1 |
| Fish Tanks. . . . . | — | — | 1621 | 1626 | — | — | 1171 48 60 | 1174 19 23 | — | — | 82 | 84 | — | — | 1463 | 1466 |
| "Bordigues" . . . . . | — | — | 32 | 32 | — | — | — | — | — | — | — | — | — | — | — | — |
| "Madragues" . . . . . | 16 | 15 | — | — | — | — | — | — | 1 | 1 | — | — | 11 | 10 | — | — |
| Total . . . . . | 38,929 | 40,985 | 2629 | 2647 | 10,711 41 25 | 11,067 41 87 | 1543 72 60 | 1553 52 30 | 15,019 | 15,652 | 197 | 202 | 25,911 | 26,516 | 2237 | 2251 |
| Increase for 1881 . . . | 2056 | | 18 | | 536 h. 00 a. 62 c. | | 9 h. 79 a. 70 c. | | 633 | | 5 | | 605 | | 14 | |
| Decrease for 1881 . . . | — | | — | | — | | — | | — | | — | | — | | — | |

DIVISION I.

. **DUMONT, CHARLES, & CAPELLE, EDMOND,** 25 Rue du Bœuf & 18 Rue de l'Epée, Dieppe. Net-irons with handles, weight about 240 kilogrammes.

. **GORDOLON, HONORÉ,** Enclos Simonot à Antibes, Alpes Maritimes. (1) Small Box containing 13 leads for bottom lines. (2) Long Rod, length about 5½ metres, furnished with a line suited for all kinds of fishing.

. **PERNEL, FRANÇOIS ALEXANDRE,** Vitry-le-François, Marne. Nets for River and Sea Fishing, with Lines, Weights and Corks complete.

DIVISION IV.

. **BOULOGNE,** La Chambre de Commerce de. Large Model of a Fishing Boat, and other objects.

DIVISION V.

. **BONNAIRE, JOUBERT,** Angers. London Agents, G. Robertson, Sons & Co., 10 London Street, E.C. Linen Sailcloth, first quality, 57 centimètres wide, Nos. 0 to 7.

DIVISION VII.

. **LATHOUD, AÎNÉ, & BELANTAN,** 43 Rue Coste, Lyon-Rhône. (1) Pocket Rods. (2) Hooks. (3) Fish Oil-Varnish. (4) Stick-gun. (5) Indelible Pencils. (6) Elastic Varnish. (7) Baits. (8) Several new Models.

. **LATHOUD, JOSEPH,** 55 Cours Moraud à Lyon Rhône. Diploma of Honour, First Prize, several Gold, Silver, and Bronze Medals, and Prizes. (1) Fishing Rods. (2) Hooks. (3) Suspending Hooks. (4) Pocket Umbrellas. (5) Pocket Sticks.

DIVISION IX.

. **BRUNEL, JOSEPH J. B. A.,** 75 Grande Rue de Pollet, Dieppe. Safety Lines, Portable, and for Permanent Stations. Since 1874 more than three hundred people owe their lives to the small Brunel lines. The rescued persons were of English, French and other nationalities.

. **DELATRE, FRANÇOIS,** 54 Park Walk, Fulham, London. Model of a Life-Boat for Sea Use. Life-Buoy shown attached.

. **DUVAL, NICOLAS & CO.,** 152 Faubourg St. Martin, Paris. Patent Life-Boat.

DIVISION XI.

. **LUCY, A.,** 57 Rue de Mareil, St. Germain-en-Laye. Signals at sea. System Lucy. Mr. Lucy has decided not to take any patent for his invention.

DIVISION XXVI.

. **JULLIEN, FIRMIN,** Lorient Morbihan (Messrs. Lyon & Co., 3 Love Lane, Eastcheap, London). (1) Sardines in oil. (2) Tunny and Mackerel in oil. (3) Sardines *au naturel*, in tins. (4) Sardines in Vinegar and in Salt.

. **OGEREAU FRÈRES,** Nantes. Boxes of Sardines in oil.

. **ONILLON, FELIX & CARON, VICTOR,** 54 Rue du Finistère, Lorient (Morbihan). Prepared Sardines with Olive Oil, in tins.

**ANDERSON, ABBOTT, & ANDERSON,**

**37, Queen Victoria Street, Londen, Engeland,**

Uitsluitende Fabrikanten van de beroemde

**LEVE ANTIPLUVIUM WATERPROEF KLEEDINGSTUKKEN,**

VOOR IEDER KLIMAAT;

Waterproef Jassen en Beenbekleedsels voor Visschers; de ligtste stof, die in de Wereld wordt vervaardigd.

. **PELLIER FRÈRES. LE MANS (SARTHE).** Sole Agent in United Kingdom, T. A. Walker, 23 Philpot Lane, London. Sardines in oil.* Tunny Fish 1. Anchovies in brine and in oil, and all sorts of preserved fish. *Packing Establishments.*—Mans (Sarthe), La Turballe, Lerat, Guérande (Loire Inférieure), Les Sables d'Olonne idée), Audierne, (Finistère). Messrs. Pellier Frères have received the highest awards at Exhibitions at which they have been represented. Fifteen Medals, Gold, Silver, and ze, some of which were gained at London in 1851 and 1862, at Paris in 1834, 1844, 1855, 1869, and at Vienna in 1873. The members of the firm were appointed to act as Judges e Great International Exhibition at Paris in 1878, and at Le Mans in 1880, consequently not compete for the medals, but were eventually awarded the Grand Diploma of Honour, he Cross of the Legion of Honour, and the Cross of St. Olaf of Norway.

. **PENANROS, GUSTAVE,** Douarnenez, Finistère. Sardines in Oil, and without bones.

. **PAGEAUT-RONDENET, & BEUCHET, J.,** Ville-en-bois, Nantes. rved Sardines and various Fish, in cases.

. **PENEAU, JOSEPH,** Nantes. Sardines in Oil.

. **SAUPIQUET, ARSÈNE,** Rue Crucy, Nantes. Preserved Fish in t boxes.

. **SOCIÉTÉ-GÉNÉRALE DES PRODUITS ALIMENTAIRES** als—London 1851, Paris 1855, Nantes 1861, Marseilles 1874, Paris 1875, Capetown 1877, 1878, Edinburgh 1882. Sole award for Sardines), 25 Rue Richer, Paris, and 101 enhall Street, London. Boxes of Sardines in Oil.

## Division XXXI.

**LES FILS OULMAN & CO.,** 8 Rue Drouot, Paris; 1 Ely Place, on. Importers of Oriental Pearls. (1) A very choice 5-rows Necklace of 355 Pearls, grains. Selected Oriental Pearls. (2) A matchless Necklace and Parure of Scotch ls, unique. (3) A very important Black Pearl Necklace, composed of 39 Pearls=1020 s. (4) One round Pearl of 96 grains, being one of the finest Pearls known, and worth er grain. (5) A very important collection of Oriental Pearls composed of 3345 grains: nal, such as are sent from Bombay. (6) Samples of all kind of fancy Pearls, such as , pink, yellow, grey; from Australia, South Pacific Islands, &c. (7) Specimen of various of Shells and Panama Pearls. (*Exhibited in the Entrance Hall.*)

## Division XXXII.

. **SMITH ET LABRIOLA,** 165 Rue St. Honoré, Paris, Manufac- s of every kind of Tortoiseshell. (Highest Rewards, Milan 1871, Naples 1871, Paris 1878, delphia 1876, Vienna 1873, and Bordeaux.)

. **GIOBERTINI & CO.,** 100 Boulevard Sebastapol, Paris, by appoint- to H.M. the King of Italy, H.M. the Emperor of Brazil. &c. Medals—Paris, Philadelphia, on, Vienna. (1) Specimen branches of fine coral. (2) Coral jewellery mounted in 18- gold. (3) Shell jewellery. (4) Fine oriental pearls.

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Sardine Fishing and Packing are peculiarly French industries, and the importance of the trade is said to ex- at of the Cod Fisheries. More than 4000 boats and a population of nearly 25,000 fishermen find employment se fisheries during the season, and an amount varying between 12,000,000 and 18,000,000 francs (£480,000 to 00) according to the price and supply, is paid annually to the fishermen for the fresh Sardines.

or Sardines packed in oil to preserve all their delicacy of flavour and fineness of quality, it is necessary tha ore than twenty-four hours should elapse between the landing of the fish and the time the tin of "Sardines in s complete and ready for shipment. Nevertheless, the preparation consists of numerous operations, which, at a detailed description being given, may be simply named, as follows:—

ounting the Sardines at landing—Salting—Cutting off the heads—A first washing or rinsing—Spreading on of a peculiar make adapted to the purpose—A second rinsing—Drying in the sun in fine weather, and in a apparatus in wet weather—Cooking in boiling oil—Draining off the cooking-oil—Packing in tins—Filling the ith oil—Soldering the lids on to the tins—Subjecting the tins to ebullition—Labelling—and finally, Packing s into cases. Through these diverse operations, the Sardines have to be manipulated *one by one.*

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ANDERSON, ABBOTT, AND ANDERSON,

**PATENTEES & SOLE MANUFACTURERS OF THE REGULATION WATERPROOF CLOAK.**

GENTLEMEN, HORSE GUARDS, 10th *March*, 1871.

The Waterproof Coat made by you has been approved of as a pattern for Coats to be worn in wet weather by all officers.—The Material seems excellent, and is exactly what was recommended by the Committee. Your pattern has been now sealed and deposited at the Horse Guards.—I am, Gentlemen, yours obediently, ARTHUR HERBERT, A.A.G., Col.—N.B.—A General Order on the subject will be issued in next month's orders.

G. O. 28. OFFICERS' DRESS.

A Waterproof Cloak has been approved of for Officers on duty in wet weather. The pattern has been sealed and deposited at the Horse Guards. It is optional with Officers to provide themselves with this Cloak, but no other Waterproof Overcoat is to be worn on duty.

**37, QUEEN VICTORIA STREET, E.C., LONDON, ENGLAND.**

. **DUCRUET, A.**, 16 Boulevard Magenta, Paris, 65 Hatton Garden. (1) Tortoise Shell. (2) Jet. (3) Fine Specimen branches of Coral, Cameos, Pearls, Sea-Shells, Jewellery.

DIVISION XXXIII.

. **PETIT, WILSON, & CIE.**, 287 Rue de Constantine, Boulogne-sur-Mer. (1) Casks for Fish of every description. (2) Cases for Preserves, Liquids, &c., machine made.

DIVISION XXXV.

. **CORNILLEAU, LOUIS, (AÎNÉ)** La Trinité-sur-mer, Morbihan. Apparatus for Oyster Culture.

. **DE CORBIGNY, HENRI**, Auray, Morbihan. (1) Oyster Shells of various sizes from the breeding grounds of Mons. de Corbigny, from 1 to 9 centimètres. (2) Boxes, Platforms, &c.

. **DELAGE, VICTOR**, 55 Rue Neuve, Rochefort-sur-Mer. (1) Plans of Mussel Grounds. (2) Fascines with the Fish adhering.

. **DE LAMARZELLE, GUSTAVE**, Morbihan. Living Oysters. Boxes for Oyster-Breeding. The living oysters will be deposited in these.

. **HEDAN, D., & JARDIN, D.**, Auray, Morbihan. (1) Plans of Oyster Parks. (2) Instruments and utensils for use in breeding and rearing grounds.

. **MARTIN, ALPHONSE**, Kergurioné, près Auray, Morbihan. (1) Oyster Shells, (2) Wooden Plaforms with Oyster Spat. (3) Utensils for Oyster Culture, &c., &c.

. **NOUGÉ, HENRI**, 13 Rue Neuve, Marennes (Charente-Inférieure). Baskets used in Oyster and Mussel Culture.

DIVISION XXXVI.

. **CORNILLEAU, LOUIS (AÎNÉ)**, Trinité-sur-mer, Morbihan. (1) Specimens of Spat. Age from 12 to 18 months. (2) Specimens of Oysters 2½ years old. (3) Tiles furnished with Oyster-Spat, a method adapted for collecting spat from the open sea. (4) Oysters reared by Exhibitor.

. **DELAGE, VICTOR**, Rochefort-sur-Mer. Oysters — Collections from Various Establishments.

. **DE LA RICHERIE**, 4 Rue Cale Ory, Lorient, Morbihan. Oyster Shells of different ages and sizes, reared in the breeding grounds of Kergroise en mer, Lorient.

. **GRESSY, DR., & EZANNO, E.**, Carnac, Morbihan. Tiles furnished with Oyster-Spat of different sizes, dead, but can be had alive if required.

. **HEDAN, L., & JARDIN, D.**, Auray, Morbihan. Oysters of all Ages and Sizes.

. **LEROUX, HENRI (DR.)**, Sables d'Olonne, Vendée. (1) Illustrations of Oyster Culture. (2) Living Oysters in Sea Water.

. **POZZY, M.**, Morbihan. (1) Oysters of all Ages and Sizes. (2) Tiles of Spat.

DIVISION LX.

. **BOUCHON, BRANDELY J. B.**, Collège de France, Paris. Works relating to Fishing, Fish-Breeding and Oyster Culture.

. **GRAND, SIMON**, Marennes, Charente Inférieure. Pamphlet on the Oyster Industry at Marennes.

. **RAVERET-WATTEL, CASIMIR**, 19 Rue de Lille, Paris. (1) Ichthyological Chart of France. (2) Provisional Map of the World, showing the Geographical Distribution of various Food Fishes.

**ANDERSON, ABBOTT, & ANDERSON'S**
**PORTABLE INDIA-RUBBER BOATS**
**For Fishing, Shooting, Exploring, and Pleasure Purposes.**
**37 QUEEN VICTORIA ST., LONDON, E.C. Works: LIMEHOUSE, E.**

# GERMANY.

(*For Plan, see p. 76.*)

RE are many advantages in the geographical position of the German Empire which iderably favour fishery and its cultivation. The vast extent of the south coast of the ic, with its multitude of useful fish, which abound still more towards the south-west, lly falls within the limits of the German Empire, while the coasts of Schleswig-Holstein, over, and Oldenburg afford a considerable seaboard on the German Ocean. The wide aries (Haffs), covering an area of 401,956 hect., and formed by the great rivers which into the Baltic, combine the advantages of both salt and fresh water, and thus greatly ribute to the success of fishery. The country may be divided into six large river districts, ted by the Rhine, Danube, Weser, Elbe, Oder, and Vistula. In these rivers, and their erous tributaries, every variety of flowing water is to be found, from mountain rivers and nts replete with all kind of salmonoids down to the sluggish streams in the plains, with r multitudes of valuable cyprinoids. Along the southern boundary of the empire, the ne slopes have formed that group of mountain lakes which by their matchless beauty ht every tourist, yet, however important these may be on account of their extent and bundance of fish they contain, they are surpassed in importance by the endless number ke-like formations to be met with in the eastern portions of the plains of Northern any, partly isolated, partly connected with each other, or with neighbouring rivers; lake-like formations are of the highest value for the purposes of fishery. The river enz (to take a single example), which is 200 kilomètres in length, connects 123 lakes of escription in its course through East and West Prussia, whereby the migration of fish atly facilitated. The area of these lakes exceeds 20,000 hect., and the fauna of the ned sea and river system comprise salmon, sturgeon, trout, grayling, smelt, the small na, perch-pike, pike, perch, pope, lamprey, and of the large tribe of the cyprinoids, carp, dace, barbel; finally large numbers of eels, and particularly fine crayfish. It must be stood that this district is not exceptionally favoured by piscatorial advantages; on the ry, the percentage of the area occupied by these waters to the total area of the district how that their extent is not above the average area covered by water in other parts of mpire. The average percentage in the seven eastern provinces of Prussia is 4·3: in rovinces of East and West Prussia alone it is 7·4, in Posen 2·0, in Brandenburg 3·0, and merania 7·7. These natural advantages must have led the people of Germany to take hing at a very early period. Indeed pre-historic discoveries have brought to light sing facts, which show how closely connected with the dawn of civilization was the ce of fishing. With the advent of historic times, we find in records, statutes, names of escutcheons, and many other things, increased testimony that fishing was a highly tant factor in the economy of the nation. The history of later periods brings to light such as these, viz.: that fishery was to a great extent the source from which the eatic League derived its power, and by which its commercial instincts were encouraged; he German Order during its colonizing efforts in heathen Prussia, bestowed a care and n the regulation of fishery in many respects worth emulating even at the present day; hat the people felt so keenly the gradual restrictions and alterations in the original right e fishing, that the claim for the restitution of this right occupied a prominent place in rogramme of the great social movement, which agitated the peasants in the sixteenth ry. In the following centuries the cultivation of fishing, in common with national my generally, suffered a great relapse, which for a long time retarded an advance from promiscuous fishing to that more methodical system which aids nature, partly by trying crease the stock of fish, partly by making proper and rational use of them. It is only very tly that the sense of the advantages of this system has returned, and at the present nt fishery associations are established in all the Confederate States of Germany, fore- among them being Prussia. These associations, which are uniformly supported by the

German "fischereiverein," and a daily increasing number of private fish-breeders of experience, vie with each other in performing their task. The beginning of this movement dates from the Prussian Fishery Laws of 1874. Although difficulties of no ordinary kind stood in the way of legislation on this subject, yet the legislator, backed by the unanimous verdict of all persons entitled to express an opinion as experts, has attained his object. A diversity of views exists as to the provisions of the provincial fishery laws passed on the basis of the general law above cited. A special subject for criticism has been the principle newly introduced by these subsequent laws of an *absolute* close time, i.e. an annually recurring period during which not only restrictions imposed on the capture and sale of specific classes of fish, but during which all fishing operations are prohibited in certain waters, or parts of the same. In whose favour the balance of opinion will at length turn; whether the new principle will prevail or whether the old system of enforcing a close time for certain species will be resorted to again at the present time be predicted; but it is certain that the ultimate decision will guide the course of legislation in the other German confederate states. The desire of a uniform settlement of fishery questions, in conformity with generally accepted views, is a strong one throughout the empire, and is shared by the different governments. Statistics have not been able to keep pace with the rapid progress that fishing has made in late years. Many of the statistical data collected in former years have now become antiquated, and are no longer in accordance with the actual state of things. To cite these data without commentary, for which there is no room in this paper, would obscure a clear survey of the subject. This applies even to deep-sea fishing, which is naturally carried on under more stable conditions. Suffice it therefore to state that the German fisherman is again becoming accustomed to look beyond the narrow field of operations afforded by the coast, and to push his ventures farther into the open sea. His endeavours to show greater energy than hitherto are actively furthered by the State, especially in the case of Prussia; vessels better suited for the purpose are built; fishery associations are encouraged; the network of railways is being extended for facilitating a rapid supply to the interior of the country; tariffs have been reduced, new contrivances for transporting fish invented, harbours of refuge constructed for the fishermen; everything in short has been done to enable them to carry on their business steadily and without interruption. A satisfactory settlement of the question of the Berlin Market Halls, which may be looked for now at an early date, will act as a powerful lever in the encouragement of deep-sea fishing. It is, however, true that much is still to be desired as far as the consumption of fish is concerned. The widely entertained prejudice against the consumption of fish not brought alive to the market is a great obstacle to a reduction in price, and one which mainly prevents a large consumption by the lower classes. The supply of sea fish and fresh-water fish, uncooked or prepared for consumption, remains in the country, and is insufficient to meet the demand. Only in those Prussian provinces which border on Russian Poland is a brisk export trade across the frontier carried on. It is right, however, to state that the export, principally from Berlin, of crayfish to France and Belgium has assumed extraordinary dimensions. The number of crayfish annually exported from that city is estimated as being at least thirty millions. Among the means of improving inland fishery, artificial fish-breeding has acquired a first place. Originally a German invention of the eighteenth century, it has been improved upon by other nations, and in its new shape has now become firmly established in all parts of Germany. The German "Fischereiverein" has made this system a basis for all its exertions and consistently abides by the principle which it has laid down in the two following sentences—"An jeder Mühle muss wenigstens ein Kalifornischer Trog arbeiten;" * and; "Ueberall in das rechte Wasser der rechte Fisch."† Consequently an animated circulation of different species of fish is carried on throughout all parts of the country; the perch-pike and nasen are translated to the west and south; the eel and salmon are to try to acclimatise themselves in the Danube; the Alpine lakes enrich those in the eastern low-lands with trout and coregonus of the best breed. The indigenous species are being augmented by imports from abroad, especially by various American salmonoids. At the same time natural breeding retains its place. Experiments with multitudes of naturally-bred young cyprinoides are more and more

* "A Californian hatching-box must work at every mill-dam."
† "Above all the right fish in the right stream."

d to and promise good results. The cultivation of ponds, which sank from a highly hing state in the Middle Ages, after the abolition of monasteries, is now recovering the l it lost; and the carp—to mention this fish only as an instance of the direction now to pisciculture,—is shown the way of improving his species by the introduction of lly selected kinds from other localities. Germany, though somewhat hesitatingly at t, is following the example of England in endeavouring to render rivers again passable gratory fish, and the problem, how to prevent the pollution of rivers more effectually hitherto, without encroaching upon the lawful interests of other industries, is now ing learned as well as unlearned heads. One thing unfortunately is yet in the initial of its development—the sport of angling. This kind of sport, at least when viewed sportsman's standpoint, is a thing almost unknown; for the public are mistaken in ing that what is commonly practised in Germany as the art of angling, is the genuine pe of this noble art. Much of its decline may be attributed to shooting, which in ny especially is such a powerful rival to other forms of recreation. Nevertheless signs of rovement in this respect are happily discernible, more particularly in Southern Germany, the votaries of genuine angling are daily on the increase. The time may not be very when the German sportsman, jostled by a throng of fellow-devotees, will with some s look back upon the day when he with his fishing-rod was the lord of boundless and icent tracts of water.

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DIVISION XXVII.

**WILCZYNSKI, E.**, Isinglass Merchant and Manufacturer, Hamburg. nglass ribbon for Brewers' use (Globe brand). (2) Fine cut Isinglass, Russian and (3) Collection of Russian Leaf, East India, Brazil Isinglass, cod sounds, Ray skin.

DIVISION XXXII.

**JSAAC, MANN**, 114 Chaussée Strasse, Berlin. Hugo Kempel, Sole r Great Britain and Ireland, New Basinghall Street, E.C. (1) 12 Slips of Whale- (2) 10 Slips Straight Arctic Whalebone. (3) 10 Slips Curved Arctic Whalebone. Bundles of *Suckers Whalebone.*

**STORK, H.**, of Ulm. (Messrs. Atkins & Nisbet, 1 Water Lane, gents.) (1) 11 Pattern Cards of Lines. (2) 1 Tackle Case in hard wood. (3) ases. (4) 31 Metal Fish. (5) Bait Cans (i.), green, small size; (ii.) green, larger ii.) yellow, small size; (iv.) yellow, larger size. (6) 1 Anglers' Pouch. (7) 1 s' Case, with compartments. (8) 6 Show Cards of Prepared Silk Lines, waterproof, d for anglers to try, and test the quality. (9) 1 Fly Rod. (10) 1 ditto, Houart, reserve joints. (11) 1 General Rod. Leather Covering (i.) for Fly Rod; (ii.) for Rod; (iii.) for General Rod.

**KRAUSS, JOSEPH** (Charles Atkins & Nisbet, 1 Water Lane, E.C., ), Piscicultural Society of Straubing (Bavaria). (1) Minute-book of the Hon. Guild of and Fish-dealers, 1672-1701. (2) Proceedings of Fisher Guild of 1553. (3) Appeal Vicedomus Christoph, &c. 1620, with seal. (4) Appeal of the Vicedomus Burkhart, 54, with seal. (5) Plan of the Fish-breeding Establishment of the Piscicultural ation of Straubing, erected in 1876. Result annually, 25,000 to 30,000 trout and ings. In the year 1882, 19,000 trout from self-bred fish.

**HERRCKE & LEBELING**, Publishers, Stettin. (Messrs. Charles and Nisbet, 1 Water Lane, Gt. Tower Street, E.C., Agents.) (1) Deutsche Fischerei g (German Fishing Gazette), 1878–1882. Silver medal of Berlin, 1880, Würzburg, wald, Linz, &c. (2) Osterreichisch Fischerei Zeitung (Austrian Hungarian Fishing

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**ANDERSON, ABBOTT, & ANDERSON'S**
**FISHING BROGUES**
**Are Unsurpassed.**
**37, Queen Victoria Street, London, E.C.**

Gazette), 1880–1883. (4) Nicklas Geichwerthschaft (Manual of cultivating ponds). Dunker's Fischeries-Kalender Fishing Almanac, 1880–1882. (6) Dunker's Taschen-Ka der, Pocket Almanac for Sea and River Fishing, 1881.

**ZENK, FRIEDRICH,** Würzburg, Bavaria. (Messrs. Chas Atkins & Nisbet, 1 Water Lane, Great Tower Street, E.C., Agents.) (1) Model of Friedrich Zenk's Fishcultural Establishment, "Seewiese," near Gemünden, Bavaria, panied by an illustrated descriptive account of the same in English and German. (2) Porcelain Incubator of size suitable for 30,000 Trout Eggs or Fry. Upward current Noteworthy is the arrangement by which the outflowing water escapes in many directions, thus creating a number of small streams and counter streams which act on eggs and brood. The arrangement in question, by subdividing the current has the advantage of preventing the fry from being pressed against the side, and collecting any one particular place. Owing to the absence of any screen for the overflow eggs and fry can be everywhere clearly seen. The material of which the apparatus structed, viz., porcelain, can be recommended on account of its cleanliness and the young brood. Price of the Incubator £3 10s. (3) Round Porcelain Incubator, suitable for 10,000 Trout Eggs. Same system as the oblong apparatus. Price 15s. Oblong Zinc Incubator, with glass grilles of size suitable for 15,000 Trout Eggs. current so arranged as to have a very enlivening effect on the young fry. Overflow ment not essentially different from that adopted in the case of the above two (5) Self-working Apparatus for feeding young fry of Salmonidæ. (6) Apparatus for porting Salmonidæ, with automatic arrangement for pumping cold air into the same. collection of living German fish, Mirror Carp, Leather Carp, Goldorfen (Idus melanotus) Tench. (8) A Treatise on the Apparatus employed in the culture of Salmonidæ. Living ova of "trutta fario" (German brook trout), bred in an ice-apparatus, October 1882. (*Vide* Apparatus 2.)

**VON DEM BORNE, MAX** (Messrs. Chas. Atkins & 1 Water Lane, E.C., Agents), Berneuchen, Brandenburg, Prussia. (1) Californian (2) Californian Incubator for use in brooks. (3) Funnel-shaped Incubator. (4) (5) Large and Small Self-Picker. (6) Transportable Dripping Incubator. (7) Filter. (8) Small Sponge Filter. (9) Tanks. (10) Folding-Frames and Boxes Packing and Transporting Fish-Eggs. (11) Conical Can for Transporting Young (12) Collection of Spinning Baits. (13) Illustrated descriptive Catalogue of the Apparatus and the following Publications:—(14) "Die Fischzucht." (15) "Fis Verhältnisse des Deutschen Reichs Oesterreich-Ungarn's, der Schweiz und Luxemb with Ichthyological Map of those countries. (16) "Taschenbuch der Angelfisch (17) "Wegweiser für Angler." (18) Pamphlets on Trout and Carp Culture, and tions to Piscicultural and Piscatorial Periodicals.

## Live Fish.

(1) Four Golden Ide. (2) Three Golden Tench. (3) Five Silurus Glanis. (4) Five sand Eggs and Fry of Brook and Sea Trout and Salmon, placed in the Californian other Incubators named above.

## Division LX.

**THE BAVARIAN FISHERY ASSOCIATION** (Bayeri Fischerei-Verein). "Guide to Angling" (Anleitung zur Angelfischerei), by Wilhelm

**THE DEUTSCHE SEEWARTE,** Hamburg.

[The list of these Exhibits had not arrived at the time of going to press.]

ANDERSON, ABBOTT, & ANDERSON'S
PORTABLE FOLDING
BATHS.
PORTABLE REGULATION BUCKETS AND BASINS.
WATERPROOF
KIT AND CLOTHES BAGS.
37, QUEEN VICTORIA ST., LONDON, E.C.

# GREECE.

(*For Plan, see p. 76.*)

fisheries of Greece, on account of the number of persons who gain their living by this hold a prominent position in the country. But these products, barely sufficing for aily consumption, do not influence foreign trade. Even in the smallest ports there are fishing-boats which practise fishing either by the net, drag-net, or line. The population g by fishing is comparatively large, but we do not know the exact figure, having no al statistics on this point.

here are in Greece twenty-four establishments for pisciculture, which are the property e state. The lease of these establishments is put up for auction by the public treasury ten years. The best of these establishments are installed in the lagoons, which extend a space of more than 30 square kilomètres, in front of the town of Missolonghi. Two-s of the population of this town earn their living by fishing, and above all by a kind sciculture, that is, retaining the fish in the lower lakes by an enclosure, and afterwards ring them just at the moment when, eager to spawn, they seek to regain the open sea. weight of the fish thus reared, and afterwards caught, amounts to more than 600,000 a year. The fish are sold fresh in the market of the same town, or that of the hbouring town, Patras (Achaia). The preparation of salt fish is only carried on on a very l scale. The best and most appreciated product of the country is the *Boutargue*. What us designated consists of ovaries full of the mature eggs of the *Mugil Cephalus*, salted and wards dried by exposure to the air. In three ports of the country, Corinth, Chalcis, and oi, they practise, especially in summer, the Sardine, Anchovy, and Scomber-mackerel ng—fish that are here always salted. Last year was very unfavourable for this fishing, it was with difficulty, even in the three above-mentioned ports, that they could muster a sand barrels of salt fish of 40 kilos. on an average. This fishery has supplied the trade with than 10,000 barrels. Last year a hundred boats, manned with crews amounting to three dred and fifty men, remained without employment.

At Spezzia one hundred and fifty men, manning twenty-five boats, towards the month of , devote themselves to the Tunny fishery by means of a net expressly made for this kind sh, of which the produce amounted to 7000 kilos. in the last cruise, which was sold fresh he market of Nauplia at the rate of fr. 1·50 per kilo. This fishery, owing to the number rsons engaged in it, is rather important, and it is to be hoped that it may be introduced to r parts of the coast. The fish that chiefly supply our markets are the red gurnet (*Mulus ulus et barbatus*); the (*Dentex vulgaris et macrophthalmus*); (*Chrysophrys aurata*); (*Pagellus rinus mormyrus*); smarides (*Smaris vulgaris*); mullet *Mugil cephalus, capito saliens labio et curtus*); whiting (*Merlangus poutassou*;) Hake, (*Merlucius vulgaris*); (*Golius jojo niger lus, etc.*); (*Epinephelus gigas*); (*Labrax lupus*); (*Lichia glaueus*); sardines and anchovies; a *box*), &c. &c., and others in smaller quantities. Not having great fisheries in the ry, we have no laws or special rules respecting them. There are laws, however, for the tion of the young fish, prohibiting the use of certain machines, and above all the drag-and seines (*pêche dite au bœuf*), and the use of narcotic plants deleterious to fish, such *Verbacum sumatum*, L. and the *Euphorbia dendroides*, L., as well as explosive materials. shermen are subject to all the sanitary laws, and rank in the class of coasters; they are nder the protection of the law and the treaties, provided that the coasting-trade and the are licensed Hellenic citizens. There is, in Greece, another maritime industry, which be separated from fishery properly so called; it is the sponge fishery which provides all the world with these articles of domestic use. This fishery is practised in three nt ways, by diving apparatus, by harpoon, and lastly by single divers. Five ports in e exclusively furnish all the sponge fishermen. They are the ports of the Island of , Hydra, Hermione, Kranidi, and Trikéri.

Of the boats employed in this fishery, 183 are used for the diving apparatus and 549 harpoons and divers. Their crews form a total of 3160 souls.

Fishing is principally carried on in the Ægean Sea, in the canal of Crete, and [illegible] coast of Africa (Barbary and Tunis). The finest sponges are found in Greece [illegible] particularly by the divers.

The produce of this fishery increased last year to about fr. 2,400,000. The sponges [illegible] sold principally in France and England.

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## COLLECTION PREPARED BY THE MINISTER OF THE INTERIOR.

### Division I.

(1) Seine Net (γρῖπος model). (2) Seine Net, but made to drag along the bottom ([illegible]) (3) Specimen of Net for Mullet-fishing. (4) Specimen of Circular Net for Mullet-fishing (πεζοβολος).

### Division II.

(1) Traps "Haveneaux à bascule," employed in lobster-catching. (2) Special [illegible] "Haveneaux," used for catching the "garfish." (3) Παράπατος, an appliance for [illegible] cray-fish in the river Peneus. (4) Three Appliances, "Haveneaux balances," for [illegible] shrimps. (5) Basket, made of reeds, with two special Traps, "Haveneaux" ([illegible]) catching eels. Full-sized model. (6) Basket, with complete set of Lines of [illegible] each, together with all accessories (παραγάδι). (7) Bell-buoy used with the Lines [illegible] and stormy nights. (8) Two Water-melons, used for buoying lines. (9) Basket, [illegible] specimens of lines of different sizes. (10) Buoys for Lines. (11) Line for [illegible] (συρτή) used in fishing for "Dentis" (Dentex). (12) Line for Seine Net (συρταρίδι) [illegible] fishing for Chad, or Horse-mackerel (Trachurus). (13) Special Line, furnished [illegible] accessories, used in fishing for Stone Bass or Wreck-fish. (14) Iron Ring, for [illegible] lines caught among rocks. (15) Line (ὁρμιὰ) for large fish. (16) Line (ὁρμιὰ) [illegible] fish. (17) Special Line, used in fishing for Stone Bass, attached to a stick. (18) [illegible] Line, employed in fishing for the "Oblata Melanura." (19) Four Lines, made of [illegible] specially employed in fishing for "Bagues." (20) Perpendicular Line (καθετή) [illegible] in fishing for the "Serranus" (χανικό). Made of horsehair, and wound upon a piece of [illegible] wood. (21) Ordinary Fishing-rod, in four parts; with line. (22) Bow Nets, [illegible] employed in Mullet-fishing. (23) Two Large Corks prepared for the "Oblata Melanura" fishery. (φελλάρια). (24) Two imitation Cuttle-fish in wood (ξυλοσουπιά and [illegible]) in catching the same. (25) Three Conical Bow Nets specially used for mullet fishing [illegible] piscicultural establishments. (26) Special Appliance employed for catching the [illegible] (27) Special Line (καλαμαργιέρα) employed in fishing for Calmars (Loligo vulgaris) [illegible] Another line specially used in fishing for the "Sepiothenthis." (θράψαλα). (29) [illegible] for detaching the bivalve "Pinna nobilis" from the bottom, together with specimens [illegible] the size of the molluscs thus obtained. (30) Brasier, to hold the fire lighted in the [illegible] the boat during night-fishing. Πυρία and πυροφάνι. (31) Hook used for detaching [illegible] from the rocks. (32) Appliance used in fishing for Sea Urchins. (33) Two [illegible] Appliances used in fishing for Cuttle-fish. (34) Conch, made to serve as a speaking [illegible] (35) Haveneau, termed a "Lazare," with accessories; used in shrimp catching. [illegible] Harpoons used in fishing for "Gilt-head" (Chrysophrys). (37) A full-sized [illegible] similar to those in daily use at the piscicultural establishment of the town of [illegible] (38) A large Pair of Scales (σταφνοκάρι), full size, composed of eight pieces of wood [illegible] net, &c. (39) Reed Screens, by means of which a model fish-pond may be constructed [illegible] to those in use at Missolonghi. (40) Collection of Fishing Tackle manufactured [illegible] lent by Landerer, X.

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ANDERSON, ABBOTT, & ANDERSON'S
FISHING STOCKINGS
ARE GUARANTEED ABSOLUTELY WATERPROOF.
37, Queen Victoria Street, London. E.C.

## Division XXVII.

"Boutargue"* (caviar) from the piscicultural establishment at Missolonghi. (2) Lobster s, from the Island of Scopelos. (3) Seven entire Cuttle-fish, dried; from Criceri. (4) n Mons. Kouphoudacis, Engineer—Model of a Fishing Boat, specially prepared for this ibition.

## Division XLIII.

a Messrs. H. Marks & Sons—A collection of Sponges taken in Greek waters.

## Division LX.

**pstolides, Nicolas Ch. D.Sc. (Paris).** "The Fisheries of Greece," a on Ichthyology, and containing descriptions of fishing appliances, methods, and products, ding also Fisheries Statistics and Legislation. 1 vol., 90 pages, published at Athens,

**MMUNE OF SCIATHOS.** (1) Samples of Materials for Sails. (2) el of a small Fishing-boat, furnished with all fishing appliances.

*Boutargue* is a kind of caviar prepared from the roe of the Mullet. The eggs are salted, crushed, reduced to a and then dried in the sun. Sometimes spices or other ingredients are added. *Boutargue* is eaten, like caviar, "hors d'œuvre," and is consumed in great quantities in Italy, Corsica, and the South of France.

*As worn by Royalty and other Members of the Royal Yacht Club.*
(Copy of Testimonial.) Home Office, *September 3rd*, 1878.
Messrs. ANDERSON & CO., You made me an Oilskin Coat about seven years ago, which has lasted in capital condition until this year.
(Signed)
A. F. O. LIDDELL.

THE ROYAL YACHTING COAT.

SOLE MAKERS,
37, QUEEN VICTORIA STREET, E.C.
ANDERSON, ABBOTT, & ANDERSON.

DIVISION II.

Osier Fishing Nets—(1) For crabs and lobsters. (2) For cra

DIVISION IV.

Fishing Canoe hollowed out from the trunk of a t

DIVISION XLIII.

Sponges.

DIVISION XLIV.

Corals.

DIVISION XLVI.

(1) Mollusca. (2) Shells.

DIVISION LI.

Living Fish.

DIVISION LII.

(1) Land Tortoise (small). (2) Sea Tortoise (sm

# HAWAIIAN ISLANDS.

(*See Plan, p.* 140.)

## The Fish and Fisheries of the Hawaiian Islands.

Hawaiian Archipelago, otherwise Sandwich Islands—a portion of the great Polynesian —are eight in number, not reckoning some small rocky islets. They lie between 18° 55′ 22° 15′ N. lat., and 154° 42′ and 160° 32′ W. long. Their origin is volcanic, and they rise an elevated plateau in the Pacific, having a depth of 1000 fathoms of water above or. Their shores are frequented by numerous species of fish and marine animals, and formerly visited by whales. Sharks abound, and are caught in numbers by the bold and ious natives, whose habits are very amphibious. They seek the shark in coves and caves -water, whilst the gorged fish sleeps with its head forced into the sides of its resting- . The diver slips a noose round the tail of the shark, which is then hauled up and tched. A *kanaka* has been known to secure in this manner six or eight sharks in a The oil extracted from them is valuable and of good quality. The fish used for diet st principally of the mullet, the most delicate of all, the albicore, the bonito, the flying- he eel, a species of mackarel, and the cuttle-fish. The two curious inhabitants of those , the *Chalcedon imperator* and the *Zeus ciliaris*, are figured by Lady Brassey in her age in the Sunbeam.' Of crustaceans there are crabs, prawns and shrimps; and of scs, the pearl-oyster, or rather *Mya*, and various shell-fish, but the common oyster is ound there. There was formerly some trade in pearls, but they were not of large size, e quality, and the search for them now is almost or quite given up. To a people whose onsisted principally of vegetable substances, fruit and fish, the preservation of the last after capture, was an important object. The double canoes, in old times so common, had en them a vessel or basket for containing the living fish. Fish-ponds enclosed from the y a wall, somewhat similar to the *viviers* on the French coasts, abounded, some of them of very great size. Numbers of such ponds still exist in the estuary or mouth of the River. The fish-ponds formed by some of the Hawaiian kings were really gigantic . Of other marine creatures, large quantities were taken of the *bêche-de-la-mer thuria*, or sea-slug). When dried it formed an article of export, the Chinese being rincipal consumers. The Hawaiians are not now so greatly dependent on the sea for since the introduction of cereals and foreign articles of consumption; nevertheless, in s near the sea, *poi* and fish—the latter often eaten raw—form the staple of their diet. n essentially littoral people "the agriculture of the sea" is a subject of very great im- nce. Lady Brassey remarks ('Voyage of the Sunbeam'), that "almost everybody they ad half-a-dozen or more brilliant members of the finny tribe, wrapped up in fresh green na leaves ready to carry home." The piscary laws and customs were severe and rather lex. The absolute despotism of the kings, the arbitrary power of the chiefs, and the ordinary effect of *tabu*, pressed heavily on all Hawaiians, and especially those who dwell near the coasts. Yet there was a certain degree of reason in those laws and the manner ich they were used. The king had universal rights in his feudal dominions, and was lord e land and sea; but he did not always and everywhere exercise those rights, and the mary laws were not altogether unfitted for the state of society then prevailing. As the aiian people, early in the present century, emerged into the light of civilisation, the rch generously put aside his feudal rights, and fashioned his government on the consti- ual pattern. In 1839 he signed a bill of rights, and in 1840 conferred a constitution on people. Statute laws soon followed; the first volume which contains them is dated in . The regulations relating to fisheries are very precise. To the king were reserved in royal fish, wherever they were caught; some had limitations. Thus the bonito was his ken off any part of the coast of the island of Lanai; the albicore, off Hawaii; the mullet, luleia; the squid and freshwater fish at Mana on Kauai. Many other fish are specified he prerogative, but as only their native names are catalogued, they fail to be recognised

here. The king was entitled to one-half of the take of these fishes. Then there were the rights of the landlord of the soil and of the sea as far out as the reefs. On his private or prohibited fishing-grounds he could reserve one species as his peculiar property. Provision was made against the fish of the king and the landlord becoming intermingled; in which case the former received two-thirds as his share, but this only in certain localities. No fish might be taken during the *tabu*. When it was announced by proclamation that this season was over, the people might take "protected" fish on their delivering one-half to the appointed agents of the king. He had vast *viviers* which had descended to him, or which he had himself constructed. Most of the islands are surrounded by a reef. Outside the reef there was free fishing for the natives. Within the reef, the littoral and riparian landowner had rights extending to the reef, or in places where no reef existed, his property in the water went out one mile from the beach. Generally the proprietor named one species for his own, and let his tenants and others take what they could of the rest. The *tabu* acted at proper seasons for the preservation of the fish quite as effectually as the restrictions of our close months do on the fisheries of our own country. The landlord having chosen for the entire year the species or variety of fish he set apart for himself, has to give notice by viva voce proclamation to the tenants and other persons residing on his lands, and to signify the same to the Minister of Interior in writing. Also a list of all the fish appropriated by the landlords is to be inserted once in English and Hawaiian, in the Polynesian newspaper. When the article relating to the royal fishing rights is invaded, the offender is, on conviction, to forfeit all fish found in his possession; and, in addition, to pay five-fold for all fish taken, or to be put in confinement at the discretion of the court. As to trade, previous to the last half century the Hawaiians had nothing that might claim the name of commerce. They sold or bartered pigs and fowls, fish and vegetables to the vessels which, few and far between, refreshed themselves on their shores. A transient trade had, indeed, existed with the Chinese in sandal wood, insomuch as that Hawaii was known in China as the Sandal-wood islands. But this source of profit came to an end by the reckless cutting down of the trees. Later on, oil was made on their shores, and in 1870, 2513 tons were exported, but in 1881 the quantity had diminished to some 500 tons. About fifty years ago a new and profitable but demoralizing industry sprang up, namely, the landing and transhipping of oil in the group. The whaling vessels of the Pacific and the transhipping called there, and more than three hundred visits have been received in a single year. These had to be supplied, and money and money's worth became abundant. The first whale ship belonging to Hawaii was fitted out in the year 1[illegible]. A record of the oil and bone landed and unshipped shows in the year 1851, the following quantities, viz.:—Sperm oil, 104,362 gallons; whale oil, 909,379 gallons; whalebone, 901,604 lbs. The trade culminated in the year 1858, when there were of sperm oil, 222,[illegible] gallons; whale oil, 2,551,382 gallons; bone, 1,614,710 lbs. The trade then declined, so that in the year 1874 it records only, sperm oil, 37,812 gallons; whale oil, 312,305 gallons: bone, 104,715 lbs. The whales in the nearer ocean had, in fact, been over-fished, and had changed their habitat to more distant grounds. This was the result of the same improvidence which had ruined the sandal-wood trade, and is in other places destroying india-rubber and other natural productions. A few whalers still put in occasionally at Honolulu, and in 1880 are reckoned, among domestic exports, 14,662 gallons of oil, and 10,917 lbs. of bone. The rise in agricultural industry, however, more than compensates for the harvest of the sea. The export of sugar from the islands in 1882 was 51,000 tons, and 221,000 gallons of molasses. 5400 tons of rice and paddy, and other productions in smaller quantities were also exported.

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## COLLECTIVE LIST OF FISHES AND CRUSTACEA EXHIBITED BY THE HAWAIIAN GOVERNMENT.

### Divisions L. & LI.

[The names given are Hawaiian. The Crustaceans are distinguished by a *.]

(1) Akule. (2) Panuhunuhu. (3) Aawa. (4) Pa Kalakala. (5) Kumu. (6) Ahaah (7) Manini. (8) Ula. (9) Amaama. (10) Anae. (11) Palani. (12) Aka*. (13) Aholehole. (14) Moi. (15) Papai Kuhonu*. (16) Oopu Okuhe. (17) Oio. (18) Paki

) Awa Ana. (20) Oopu Kai. (21) Kaku. (22) Hilu Maoli. (23) Maono. (24) Moi. ) Kala. (26) Olali. (27) Moano. (28) Auku. (29) Pua Ana. (30) Akule. (31) Awa. (32) Lai. (33) Au Au. (34) Palani. (35) Poopaa. (36) Aoao Nui. (37) e. (38) Opihi. (39) Puhi Uha. (40) Hinalea Luahine. (41) Uu. (42) Kahala aleia. (43) Ulua. (44) Aholehole. (45) Uku. (46) Ulapapapa. (47) Nenue. ) Awa Maoli. (49) Lauhau. (50) Hee. (51) Aoao-Nui. (52) (53) e Lauli. (54) Pua Amaama. (55) Pauu Ulua. (56) Alaeke. (57) Kihikihi. (58) akawa. (59) (60) Maii. (61) Kole. (62) Moano lauli. (63) Opae ale* (mountain shrimp). (64) Kanio (fresh water). (65) Alamihi (brackish water)*. Opucle Maoli. (67) Nehu. (68) Kukuau*. (69) (70) Olipe*. Hinalea. (72) (73) Pupu. (74) Kaulelоa. (75) Awela. Opae Oehaa. (77) Opae Lolo. (78) Weke. (79) Moamoa Waa. (80) Opulo Lauli. Mauanalo. (82) (83) Awa Kalamoho. (84) Uhu Eleele. (85) Lolo*. (86) Lauwiliwili. (87) Upapalu. (88) Alo*. (89) Aloalo*. (90) Moala. Pokipoki. (92) Alaihi. (93) Ahuluhulu (young of Kuma, No. 5). (94) Uhu Aa. Nunu. (96) Nokea. (97) Iheiho. (98) Omilu. (99) Mamamo. (100) Maikoiko.

## Division XXVI.

) Omalemale. (138) Akule. (142) Hauliuli. (143) Hee. (152) Oio.

## Division XLII.

Edible Algæ.

Huna. Limu Eleele (from brackish water). Lipoa. Nanue. Limu Kala Kai. ee. Maneoneo. Mananea. Oolu. Lipala (from the sea within the reef and from tidal Limu Kohu (from among breakers on reef). Aola Ula. Limu Eleele Maewa. Koiale. Kala Wai (from fresh water). Those not otherwise marked are from the sea within the nd from tidal pools.

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## MISCELLANEOUS.

o stone Adzes used (formerly) by Hawaiians in digging out and shaping their canoes. o Fishing Lines made of Olona fibre, an indigenous production still deemed superior ngth and durability to any other. (3) Fibre of the Olona (or Olo-Na). (4) Root and f the Olona. (5) Leaves of the Olona. (6) Malo, Fisherman's Waist-Cloth. (7) Pau ife's Waist-Cloth. (8) Apua Basket-net for catching shrimps in mountain streams. ecimens of the plant used for poisoning (stupefying) fish (Tephuosia-piscatoria). (10) Melo-melo (Decoy Stick). (11) Ipu Aho (Gourd and Fish Line). (12) Hinai Kala, (Kala Basket). (13) Pokako me ke Aho (Reel and Line. (14) O-Pa (Fish Spear). Upena Uluulu (Divers' Net). (16) Upena Uhu (Decoy Net). (17) Upena Opulo Net), another variety. (18) Upena Kahala (Decoy Net), another variety). (19) Aha (Cayar-fibre Net), central part of a Kolo Net. (20) Small piece fine Olona Net nukunuku a ula), highly prized. (21) Pa, 2 (Two Hooks for catching Bonita and ore. (22) Pa, large (Hook for catching Bonita and Albicore). (23) Eke Upena papa. Net of Olona fibre. (24) Bag Net with sinker. (25) Cowry Octopus Hook. (26) of a favourite form of Fish Pot (or Trap). (27) Fish Pot (or Trap) full size, made by ians, but on a South Sea Island pattern.

Of the above, Nos. 1-9 and No. 11 are exhibited by His Majesty King Kalakaua, and No. 22 by His Excellency the Hon. H. M. Gibson.

## Division XX.

n Outrigger Canoe, twenty-five feet in length, wrought out of one log of hard wood: with ger. Contributed by A. MacCunn, Esq. (2) Paddles of Koa Wood. Lent by Pritchett, Esq.

**ANDERSON, ABBOTT, AND ANDERSON'S**

**PATENT TANNED CANVAS RUBBER-LINED FIRE HOSE.**

*SUPPLIED TO ALL PARTS OF THE WORLD.*

**Guaranteed Pressure, 300-lbs. to the square inch.**

**37, QUEEN VICTORIA STREET,**

LONDON, ENGLAND.

*Prices, Samples, and Opinions of the Press on application.*

DIVISION XLII.

(3) Neptune's Cup; a submarine fungoid, dredged up in fifty fathoms water. Lent by Captain A. Roper.

DIVISION XLVI.

(4) Two Cases, containing 117 species and varieties of Hawaiian Shells, partly named.

DIVISION LI.

(5) Flying Fish (*Exocetus volitans*). Lent by Captain Roper. (6) Pig Fish. Lent by Mr. Deller. (8) Young Pig Fish.

DIVISION LVII.

(7) View of Diamond Head—one horn of Honolulu Harbour. Double Canoe coming in with nets. (8) Honolulu, from the Bay. (9) Honolulu, shewing Reef and Entrance. (10) Kalakaua, the old residence of the Kings of Hawaii. (7–10 Sketched during the cruise of the yacht *Wanderer* and lent by R. T. Pritchett, Esq.) (11) A collection of thirteen photographs of the Great Lava-flow in 1880–1881, from Mauna Loa, Island of Hawaii. Lent by Captain Roper. (12) A Collection of Miscellaneous Objects recently made in the islands of Polynesia, Micronesia, &c. Lent by Lady Brassey. The majority of these exhibits are not immediately connected with Fish and Fisheries, but are related to, and illustrate, ocean races essentially piscatory in habits and pursuits.

THE LADIES' ROYAL YACHTING ULSTER
BLUE CASHMERE LINED SCARLET.
*SOLE MAKERS:*
ANDERSON, ABBOTT, AND ANDERSON,
37, QUEEN VICTORIA STREET, LONDON, E.C.

# ITALY.

(*See Plan, p.* 76.)

I. Introduction.—Owing to the time and space conceded, this must be consider merely as a very condensed essay on the subject. Italy cannot be said to possess any of t grand fisheries and extensive fish-cultural establishments of Northern Europe; our seas a numerically richer in species, but far less so when the number of individuals of importa food-fishes comes to be considered; and our fresh-water fish-fauna is certainly poor in gam fish, while our rivers are relatively few and small. It must, however, be borne in mind th the fisheries of few countries, and of none in Europe, present such a variety as those of Ita A vast amount of information on the subject is contained in the five big volumes, "*I Pesca in Italia*," edited by Professor A. Targioni Tozzetti, and published by Governme (Ministry of Agriculture, Industry and Commerce) between 1871–74. The matter contain in this publication was principally collected by local committees, in order to bring togeth the information necessary for the compilation of a uniform fishery legislation. The first thr volumes are dedicated to sea-fisheries, the two following to freshwater-fisheries; the arrang ment of the contents, owing to the special object in view and consequently to the syst followed in collecting the materials, is somewhat defective, and inevitable repetitions occu yet the amount of most valuable information on the former fishery legislation, local privileg and traditions; on the divers fisheries, nets, implements and boats used; on the soc condition, manners and customs of fisherfolk on the different parts of the Italian sea-coast lagoons, lakes and rivers; and the number of documents, edicts, &c., some of special histori value on the subject, collected, is very great. Professor Targioni Tozzetti published besid a condensed, but yet lengthy, report on Italian Fisheries, as an Introduction to the Offic Catalogue of the Italian section at the Berlin International Fisheries Exhibition in 18 (*Esposizione internazionale di Pesca in Berlino.* Sezione Italiana. *Catalogo degli Esposit e delle cose esposte*, pp. xvii.-cxxxvi. Firenze, 1880). Besides, different reports on spec fisheries have been published from time to time by Government. From these differe sources I have collected much information, without which my task would have been easy one.

II. Fishery Legislation, Past and Present.—As a natural consequence of her lo political division, few countries, up to quite a recent date, presented such a varied and lar amount of edicts, laws and regulations relating to fishery, some dating back to the earli part of the Middle Ages, as Italy. A large series of big volumes would be required to colle the documents relating to past Italian fishery legislation, and a varied and singular collecti it would prove, interesting besides as bringing down to our days some of the piscator traditions of the ancient Greeks and Romans, curious from a linguistic point of view as medley of corrupt Latin, mediæval Italian, Spanish and local dialects. I may quote among the more remarkable of such documents the innumerable decrees of the Republic of Veni relating to fishery and pisciculture, in the lagoons and *valli*. One of the earliest bears t date 13th August, 1314; and the curious Red Book (*Libro Rosso*), regulating to the small details all fishery matters of the inner sea (*Mare piccolo*) of Taranto, which dates positive further back than the fourteenth century. Many such documents were originally emanat to establish feudal rights, which afterwards became the heirlooms of municipalities devolved to the State. From the earliest periods of any social status, piscatorial a maritime matters have been much mixed up together, and fishermen and sailors regulat by identical laws; on regaining her liberty and completing her unity, Italy sought in t first place to render as much as possible homogeneous and uniform the varied legislations to that period regulating the status of the different parts of the country now brought togethe the promulgation of the Civil Codex of the new kingdom of Italy was shortly followed that of the mercantile navy, and in this last was clearly established that while all t disciplinary regulations relating to fishermen and fishery along the sea-coasts, more especial on account of the maritime conscription and registration of boats, was to depend on the cent naval administration (Ministry of Marine), all that related to the economy of fishery w

Local wants and special cases had been carefully provided for, and
pervaded the whole; yet, on application, many serious difficulties ar
expected: protests and petitions came in from different parts of the
several articles of the new bye-laws, but more especially directed ag
placed on trawling. A permanent *Consultive Fisheries Committee*, co
persons—members of parliament, professors of zoology, and governmen
while been named by royal decree; to this committee devolved the t
objections to and petitions regarding the new fishery regulations, and
special cases that had been overlooked or not sufficiently provided for.
through by single members and in two general meetings of the Fisl
the results were new and revised regulations both for sea and freshwa
of which, promulgated on the 13th of November, 1882, appears to have
ments of most fishermen, and to guard sufficiently the preservation ar
more important species of food-fishes. It consists of ninty-nine arti
chapters. The new regulation for freshwater fisheries is now ready. Su
account of the actual state of fishery legislation in Italy.

III. Sea-Fisheries.—*A. General.*—1. *Fishermen.*—Not everywhere a
board do fishermen, as in other parts of Europe, form a separate and v
reason of this must be sought in the comparative small importance of sp
the Mediterranean and in the Adriatic. Along many miles of our coas
desultory manner by old men, women and children, who do any othe
while the able-bodied men are away at sea or as workers in naval y
some localities the inhabitants do not fish at all. But exceptions also
most remarkable cases is that of Chioggia near Venice, where the en
except infants, is engaged in fishery, and passes a large portion of the
down the Adriatic to the Ionian islands. On the southern Italian c
ranean fishing populations are also met with, and as especially so may
tants of the Ponza Islands, Ischia, Faro (Messina), Trapani and Tar
course, special fisheries are usually in the hands of special classes of
the thunny, anchovy, and precious coral. 2. *Boats.*—A bare enumer
kinds of boats used for sea-fisheries along the coasts of Italy would f

ıtic, remarkable for the shape of their hull and their strange sails coloured in brown ed and covered with quaint figures and strange devices; next come the *paranze* or e of the Mediterranean, far less showy and characteristic. These boats generally work ınd mostly use trawling nets. 3. *Fishing Implements.*—The number and variety of very great and rendered apparently more so on account of the different terms used for implement in different parts of the country, so much so that at one of the general of the Fisheries Committee the writer proposed a resolution, which was passed, desiring ent to have a synonymical and descriptive list collected and published to facilitate the on of legislative measures. The nets used are of many kinds, but may be classed in cipal divisions, viz. standing and trawling nets (*reti da posta* and *reti da strascico*). e out of the question that I should here enter into a concise description even of the varieties. I can merely state their names. To the first series belong the following: *da, Manaidozza, Signorella, Vollaro, Mugginara, Tramaglio*, each having special according to the species of fish for whose capture they are used: thus there is a for anchovy, another for sardine, a third for *Atherina*, a fourth for Pelamid, and a ed *Squadrara*, for small sharks and angel fish (*Rhina*). Besides, the special nets which *Tonnare* belong to this division. Trawling-nets are much used and of many I may mention as more generally in use the following:—*Tartana, Tartanone, Sciabica, Sciabichella, Bragagna, Coccia, Rezzuola, Mazzonara, Agugliara*; they prin- iffer in size and in the manner they are worked. Some are drawn by hand in shore, y a single boat, others by two boats sailing. To this division may be added the , *Retequadra*, and *Giacchio* or throwing net. Lines and hooks are also much in use, very complex concerns, having different names according to the number of hooks, their the best known go by the names of *Filaccioni*, used along the coast, and *Palamiti* or se, used in deep-sea fisheries. Traps of different sorts are used for large crustacea, y lobsters, and go under the generic term of *Nasse*. Harpoons (*Fiocine*) of different re also in use, especially for capturing the sword-fish, chrysophrys, &c., and in the nocturnal *lampadara*-fishery. Special implements are employed for the capture of and shellfish and for dredging precious coral. Illegal modes of capturing fish are but too often resorted to: thus dynamite (*torpedini*), cocculus, and the mela terragna n), used in the capture of rock-loving fish, with the *Chiusarana* along the Neapo- sts. 4. *Marine Animals.*—These will be classed systematically. *a. Seals and Whales.* not afford any special fishery in the Italian Seas. The Mediterranean seal (*Pela achus*), found also along the S.E. shores of the Adriatic, is by no means common and ptured; they are mostly taken alive with nets placed at the entrance of the grottoes known to frequent, and sold to showmen, who exhibit them alive. True whales are rare occurrence, only one authentic capture of the all but extinct Basque whale *biscayensis*) is on record, and took place at Taranto on the 9th of February, 1877; one of the capture of *Balænoptera rostrata* is also known, near Villafranca, in February, arely, too, has the fin-backed whale (*B. musculus*) been caught or stranded. Sperm- *Physeter macrocephalus*) have occurred now and then in both seas, and occasional s of *Ziphius cavirostris, Orca gladiator, Pseudorca* (?), *Grampus griseus* and *Globicephalus* ve been taken. The common cetaceans in the Italian seas are dolphins (*Delphinus* d *D. delphis*), who often cause great damage to fishermen by destroying their nets, so that those of the Ligurian coast lately petitioned Government that a prize might be for the capture of dolphins; these are not sought for, although their flesh is eaten e Adriatic, but near Palermo there is an establishment where they are boiled down ogether with the heads of thunnies and other refuse of that fishery. *b. Turtles.* One lone may be called common, it is the *Thalassochelys corticata*, sold as coarse food in cets of Souhern Italy; two other species, *Chelone viridis* and *Sphargis coriacea* occur, xtreme rarities. *c. Fish.* Of the 460 species known to inhabit the Mediterranean and Seas, most are sought for by fishermen and used as food; I need only except: *Cen- Argyropelecus, Coccia, Maurolicus, Gonostoma, Chauliodus, Scopelus*, all Lophobranchs, *riscus* and *Branchiostoma*, as unfit for human food; the Elasmobranchs are all eaten, larger species of sharks which are sent to inland markets, and cut up, sell well. As remarked, the Italian seas do not afford many cases of large and important special

fisheries, and those few will be quoted further on. I may here add that the most esteemed game-fish, as the Americans style them, are furnished by the following genera: *Labrax*, *Serranus*, *Dentex*, *Mullus*, *Sargus*, *Pagrus*, *Chrysophrys*, *Scorpæna*, *Trigla*, *Sphyræna*, *Rhombus*, *Trachinus*, *Umbrina*, *Sciæna*, *Lepidopus*, *Scomber*, *Pelamys*, *Orcynus*, *Brama*, *Coryphæna*, *Lichia*, *Seriola*, *Xiphias*, *Merluccius*, *Rhombus*, *Solea*, *Engraulis*, *Clupea*, *Conger*, *Muræna*, *Anguilla*, *Mustelus*, *Raja*. Very abundant, but sold as cheap food for the poorer classes, are species of the following genera: *Mæna*, *Smaris*, *Box*, *Pagellus*, *Trachurus*, *Gobius*, *Lophius*, *Blennius*, *Alburnus*, *Mugil*, *Labrus*, *Crenilabrus*, *Pleuronectes*, *Arnoglossus*, *Belone*, *Rhina*, *Torpedo*. In concluding I may remark that there is a notable difference between the fish-fauna of the Mediterranean and that of the Adriatic, the latter has a much more northern character: flatfish abound and attain a greater size, and some genera and species common in that sea, as sturgeon (*Acipenser*), *Gadus euxinus* and *Pleuronectes italicus*, are unknown or very rare in the Mediterranean. *d. Crustacea.* Most of the numerous species inhabiting our seas are used as food, even the smaller ones; but setting aside the Mediterranean lobster (*Palinurus*), of which I shall speak hereafter, I need only mention those genera which are more often met with in large quantities at our fish-markets, thus: *Maia*, *Cancer*, *Calappa*, *Eriphia*, *Homarus*, *Scyllarus*, *Palæmon*, *Penæus*, *Nika*, *Nœphrops*, especially in the Adriatic, and *Squilla*. *e. Mollusca.* Both species of Cephalopods are commonly used as food and sold at the markets along both coasts, while the tougher species of *Octopus*, *Eledone*, and *Sepia* are classed as coarser sorts and sold cheap, the more tender *Sepiola* and *Loligo* fetch higher prices and are much esteemed. A large number of shell-fish are used as food in Italy, and nowhere so well as at Naples, where Lucia, may the enquirer satisfy his curiosity on this point; besides the common oyster, of which anon, the tables of the "*Canolicchiaro*" show the following genera, often represented by more than one species: *Solen* (Canolicchi), *Solecurtus* (Lattari), *Donax* (Tonninole), *Venus*, *Cytherea*, and *Tapes* (Vongole), *Cardium* (Cocciole), *Pecten* (Canestrelli), *Pinna* (Madrepels); both *Mactra*, *Mytilus*, *Modiola*, *Arca*, *Spondylus*, *Lithodomus*, and other Lamellibranchs. Univalves are also richly represented by species of the genera: *Patella*, *Haliotis*, *Natica*, *Nassa*, *Murex*, *Tofa*, *Dolium*, &c., &c. *f. Echinoderms.* This class also furnishes food along the sea-board of Italy, and in the markets near rocky coasts may often be seen baskets of sea-urchins (*Echini*), of which the following species are commonly eaten: *Echinus melo*, *E. lividus*, *E. brevispinosus*, and *E. saxatilis*. *g. Cœlenterata.* Two species of sea-anemone are used as food, and commonly known under the name of "*Ogliole*;" they are *Actinia viridis* and *A. equina*. Other members of this division are the object of special fisheries, but not for the table; they are precious corals and sponges, and will be mentioned by and by. *B. Special.*—1. *Thunny Fishery.*—This is the most important special sea-fishery, and although the common thunny (*Orcynus thynnus*) is the principal item of this industry, not a few allied species are caught by the same means and treated in the same manner. I may mention the following: *Orcynus brachypterus*, *O. germo*, *Thynnus thunnina*, and *Auxis Rochei*, all sea fishes, which periodically and successively visit in large numbers different parts of our coasts: thus a precise knowledge of the direction and epoch of such migrations was necessary for establishing the localities and seasons where such fisheries could advantageously be undertaken. The principal thunny-fisheries on the Italian coasts (*Tonnare* and *Tonnarelle*) are: S. Margherita (Liguria), Marciana and Enfola (Elba), Porto S. Stefano (Tuscany), Bivona and Pizzo (Calabria), Portoscuso, Portopaglia, Isola Piana, Calavignara, Flumentorgiu, Alghero, Saline, and Trabucato (Sardinia), Olivieri, S. Giorgio, Vaccaro Pepe, Marsamemi, Capo Passaro, Favignana and Formica (Sicily). In the Adriatic thunnies are caught, but I know of no regular *Tonnara* except that of Porlucca near Fiume. The methods used in catching thunnies do not differ much, but the *Tonnare* are of various size and extension; they consist of a series of large chambers closed in by strong netting, the outer one opens widely in the direction from which the migrating fish are to come and so intercepts them, the inner or last chamber is graphically called *camera della morte*—it can be shut off from the rest and drawn up, and here the killing or massacre takes place, a most exciting but not pleasant scene. Curious traditions regulate the doings and special task of each man employed in the *Tonnare*, and these differ slightly in Sardinia and Sicily; in the *Tonnare* of the former island about 1000 men are employed, in those of the latter about 1400; they give together a yearly product valued some ten years ago at between three and four millions of lire (francs); the entire produce of the thunny fishery in the Italian

vas valued at the same date at about seven millions of francs annually. The incomplete returns for 1882 give a total of 39 *Tonnare*, not all at work, and the produce of four of Pizzo, Bivona, Ischia and S. Margherita) is rated at 271,120 *lire*. 2. *Swordfish Fishery.* fish (*Xiphias gladius*) is the object of a very peculiar if not extensive fishery on the an and Sicilian coasts and in the adjacent Straits of Messina, between the months of nd September. These fish, which have the habit of swimming near the surface, and o travel in considerable numbers in that season, are sighted by look-outs (*antennieri*) seated on the very tall masts of peculiar boats (*feluche*), near these are stationed a of fast boats (*lontri*) with a shorter mast, on which is perched the *foriere* who follows ection shouted and pointed to by the *antenniere;* on the prow stands the harpooner *tore*), and as the boat is swiftly rowed up to the fish, he throws his harpoon (*draffi-* the wounded fish is followed up by a second fast boat, the first returning near that holds the *antenniere*. It is a most exciting scene, witnessed once near Messina. It has escribed, nearly in the same words, by Polibius and Spallanzani and Vetrioli, at an l of nigh 2000 years. 3. *Anchovy and Sardine Fisheries.*—These two fisheries, which early a very considerable produce, take place usually during the summer months, and ts called *manaide* are more frequently used. The anchovy (*Engraulis enchrasicholus*) ht in greater numbers in the middle and southern parts of the Mediterranean, and lly amongst the Tuscan islands and off the coasts of Sicily; also in the Adriatic, towards lmatian coast. This fishery is practised by fishermen from Chioggia and Ancona. At fires are lighted to attract the fish, which keep in shoals. The sardine (*Clupea pil-s*) is caught in much the same manner and during the same season. Both are usually and a preliminary cure is given by the fishermen themselves in their boats. To give of the value of this fishery it may be stated that at Palermo alone the produce at one was 600,000 kilogrammes of sardines, valued at 200,000 francs, and 400,000 kilogrammes hovies, valued at 400,000 francs. 4. *Hake Fishery.*—This fish (*Merluccius vulgaris*) is nly known by the name of *Nasello*. It is one of the commonest and most esteemed the Italian seas, and may constantly be seen in numbers, of all sizes, in our markets. In it is generally taken by trawling, but during the summer months it appears to retire per waters, and then very large specimens are caught by hook and line, with the *pala-palangrese;* with it are also taken in depths, varying from 3 to 800 mètres, huge s, *Mora Mediterranea*, *Phycis*, and other species. 5. *Whitebait Fishery.*—This special is only allowed, for particular reasons, in a few localities—principally along the Ligurian It is practised with trawling-nets of a very fine texture, and only from January to Under the generic name of "whitebait" have been included the "*Rossetti*," scienti-known as *Latrunculus pellucidus* and the "*Bianchetti*," which are the young fry of the ry and sardine; the destruction of the latter is certainly detrimental to fishery interests, ght to be stopped or restricted as much as possible. 6. *Lobster Fishery.*—In the Italian e common lobster of Northern Europe (*Homarus marinus*) is rather of rare occurrence, replaced by our "*Aligusta*" or "*Aragosta*" (*Palinurus vulgaris*), the object of a most ive fishery on the rocky parts of our coasts, and more especially amongst our smaller s. Civita Vecchia, Pozzuoli, and Maddalena, in Sardinia, are three of the principal s for lobster fishermen; these men seek their fishing grounds at considerable distances their homes, they go in parties in smallish lateen sailed boats, secure their prey with ar nets or basket-traps (*nasse*), keep the lobsters imprisoned under water in much larger and awaiting an opportunity, embark them alive, carefully wrapped in wet sea-weed ne passing steamer. I once met several of these fishermen on the small island of Monte-they then had over 2,000 lobsters which they were preparing to ship to Genoa. 7. *Sepia ry.*—From very ancient times the capture of the common cuttle-fish (*Sepia officinalis*) has the object of a very peculiar fishery on the Southern Adriatic coasts, from Bari to Man-ia: small bunches of lentisk (*Pistacia lentiscus*), called *vorle*, are tied at intervals to a and fixed under water at about 8 or 10 mètres from the shore; the cuttlefish seek their r to deposit their eggs, and are then easily caught. The present law forbids this destruc-ind of fishing. 8. *Pinna Fishery.*—Near Elba, on the Sardinian coasts, and especially Antioco, at Taranto, Gallipoli, and along the Sicilian shores, in comparatively shallow , lives the large and beautiful *Pinna nobilis*, which is sought for on account of its shell,

its flesh (eaten cooked), its byssus (from which a singular kind of silk is woven), and the rare coloured pearls it sometimes contains. It is taken by diving, or, more ingeniously with a stone fastened to a string carefully let down into the open valves, which close tenaciously, and the animal is drawn up. 9. *Coral Fishery.*—This is beyond doubt one of the most interesting and peculiar fisheries in the Mediterranean, and deserves a less passing notice than that which I am obliged to give. The coral-fishermen form a peculiar class, and in Italy hail from S. Margherita (Liguria), Leghorn, Carloforte, and Alghero (Sardinia), Torre del Greco, Trapani, and Messina; their boats (*corallini*) are also peculiar and of two sorts: the larger from 10 to 14 tons burden, the smaller from 2 to 6; they are decked and have a mast, lateen sail and jib; a peculiar feature is the large wooden windlass amidship, for hauling up the dredge called *ingegno:* a St. Andrew's cross about 2 mètres in length, weighted with stone or iron and garnished with about 30 tangles made of rough netting and cordage; other not less primitive implements are used for disentangling the dredge, should the occasion occur. The larger boats are mounted by a master, an assistant, a steersman, and 8 hands; the smaller manned by 5 or 6 men. The coral grows in suitable localities in most parts of the Mediterranean, Ionian Sea, and South Adriatic; it requires a rocky bottom, and affects especially banks covered with madrepora and shells at depths varying from 50 to 200 mètres, rarely more. The coral patches or banks are mostly as well known to the *corallari* as are the islands which rise above the sea; the best localities are now off the coasts of Sardinia and in the shallow sea between Sicily and Pantellaria, but no doubt undiscovered coral-banks are yet to be found, though probably not many. During voyages in the Mediterranean *corallini* are often seen at work in Bonifacio Straits, near Castelsardo, off the W. and E. coasts of Sardinia, but especially between Sciacca and Pantellaria. There, on the extreme edge of the "Adventure Bank" not far from Ferdinandea or Graham's Island, much coral has been got in the last few years, principally off three patches, but mostly dead and blackened, not unlikely killed by the volcanic eruption which caused the above-mentioned island to rise and then disappear in 1831. Many hopes had been raised by the discovery of the Sciacca coral-banks in 1875, 1878 and 1880, and as much coral, though of a very inferior quality, had been got from them, the Government was induced to have them explored. This was partially done at the end of August, 1881, by Professor Ricchiardi. The writer of this was present with him on board the man-of-war steamer *Washington*, and will not easily forget the animated sight of over 300 *corallini* at work, amidst which we steamed on the 30th of August. In 1882 the exploration of those banks was completed, again by the *Washington*, with Professor Canestrini on board; the results were to show that the *dead coral* on those banks has been nearly all fished out. Professor Parona has been recently, by Government order, investigating the conditions of the coral-banks of the Sardinian coasts; his report on the subject is now in the press. Precious coral was sought for off the coasts of Northern Africa by the Pisans as far back as the [illegible] century; its discovery off Sardinia dates from the sixteenth century; off Calabria from the seventeenth century. The produce of this fishery appears to be on the decline. In 1871 only 359 *corallini* boats were registered from Italian ports, Torre del Greco alone sending [illegible]. The men engaged in this fishery numbered 3623, and the mean annual produce was calculated at about 60,000 kilogrammes of good *living* coral, of the approximative value of five millions of *lire* (francs). The produce of the coral fishery on the Sciacca banks from March to October, 1882, as given by official returns, was 19,120 *quintali*, valued at 4,493,200 *lire*; 582 boats and 5766 men were employed. The banks discovered in 1875 and 1878 are quite exhausted; that found in 1880 is expected to yield from 20 to 25 *quintali* per boat during the present season, 1883. It must be remembered, however, that this is all or nearly all *dead* coral of low price. The coral-fishery is usually undertaken from March to October, but in some parts, weather permitting, it takes place at all seasons. 10. *Sponge Fishery.*—This industry is principally in the hands of Adriatic fishermen, and undertaken amongst the rocky islands of Istria and the Dalmatian coasts; a certain number of Sicilian fishermen are, however, employed in this fishery off the Tunisian coast near Sfax. The species sought are: *Spongia [illegible]sima*, the most valuable, *S. adriatica* (?), *S. zimoca*, *S. equina;* the methods employed are two—diving and trawling.

IV. Lagoon and Estuary Fisheries.—These fisheries, which in all respects form a connecting link and occupy an intermediate position between saltwater and freshwater

.es, have a special importance in Italy on account of the number and extension of salt ackish-water lagoons near the mouths of rivers or elsewhere; such are the extensive f Comacchio, Codigoro, and those further north joining on to the Venetian lagoons; the Sardinian *stagni*, as those of Cabras (Oristano) and Cagliari; the *stagni* of Orbetello urano in Tuscany, that of Lesina in Puglia, and others; and in a way the *Mare piccolo* anto. Fish, crustacea, and mollusks are the product of these fisheries, which also give on to a special kind of pisciculture, of which anon; I need here only dwell especially me of the former as yielding the more valuable produce. Many species of crustacea ken, and I may mention *Carcinus mænas*, one of the more abundant, used however chiefly t; while *Eriphia spinifrons*, *Crangon vulgaris*, and *Squilla mantis*, are esteemed as food. nore remarkable mollusks belong to the genera, *Sepiola*, *Sepia*, *Cerithium*, *Gibbula*, *Tapes*, *Cardium*, *Mytilus*, and *Pecten*. Not a few fishes generally considered marine the brackish water lagoons and live and thrive there in company with other species y classed amongst freshwater creatures. I may mention the genera, *Labrax*, *Mugil*, na, *Solea*, *Pleuronectes*, *Esox*, *Leuciscus*, *Anguilla*. In purely saltwater lagoons some of er sorts of game sea-fish abundantly resort, as *Mullus*, *Chrysophrys Umbrina*, *Corvina*, us, and several species of *Gobius*, especially *G. paganellus* and *G. ophiocephalus*. The l fisheries of greatest economic value undertaken in Italian lagoons and estuaries are llowing. 1. *Grey Mullet Fishery.*—The genus *Mugil* is richly represented in our Ichthyo- ; the six species, *M. cephalus*, *M. capito*, *M. auratus*, *M. saliens*, *M. labeo*, and *M. chelo*, ommon, the first four abundant, and live not only in the sea but frequent brackish s and enter rivers. In some of the *valli*, lagoons and *stagni*, their capture is on a very scale, and gives a notable produce; a peculiar net, the *mugginara*, is usually employed. Targioni Tozzetti graphically describes one of these fisheries, which he witnessed bras in Sardinia: the proceedings resembled on a smaller scale those at a *Tonnara*, e men dived and seized under water the mullets imprisoned in the *mugginara*, the scene a most curious and exciting one; on that occasion 1200 kilogrammes of fish were d and considered a poor result. 2. *Eel Fisheries.*—The common *eel* (*Anguilla vulgaris*), its many varieties and sub-species, is one of the most common fishes in Italy; it is t in the sea, in brackish waters, and in fresh water, but more especially in lagoons and ies, and affords one of the more important items of our fisheries. It is now well known the eel reproduces itself at sea, the young fry entering rivers and lagoons in myriads, long the coast between Leghorn and Viareggio, in canals leading from the sea into the and adjacent lagoons. This gives occasion to a most peculiar fishery, that of the *Ceche*, being given the name to these young vermiform and semi-transparent eels. During months of December, January, and February, they swarm in countless numbers in such ties, where, for special local reasons, their capture is allowed during the period nated. In the so-called *lagune*, *campi* or *valli* of Comacchio, extensive salt and ish water lagoons at the delta of the Po, between the branches called *Po di Volano* and *Primaro*, eel fishery is an ancient and important industry. Only the adults are t, and principally at two periods, autumn and Lent. To give an idea of the produce, y state that the *valli* belonging to Comacchio alone give a mean annual produce 25,000 kilogrammes of *preserved* eels, valued at 735,000 *lire*. In 1871, 1,307,558 kilo- mes of eels were got.

V. Freshwater Fisheries.—I have already stated the reasons why these are not of great tance in Italy; except in the northern portion of our country, the rivers are insignificant the lakes of small extent; the freshwater fish fauna is besides not rich in species of mic value, such as elsewhere in Europe form the object of an important piscatorial try, as salmon and sturgeon are entirely wanting or not abundant. As I have before oned, for obvious reasons, special regulations, distinct from those relating to sea fisheries, te those in rivers and lakes. The fishermen on fresh waters are far less distinct as s than those who seek their living on the sea, yet in some localities they also form a ct part of the community. The boats they employ, with their flat bottoms and nt shapes, rarely rowed, and more often poled, are very different from the sea-going Again, the nets they use are often different and always of smaller size. In fresh s it is easier to employ illegal methods for capturing fish; and various poisonous

and *S. carpio*) are caught in considerable numbers; and again the shad (*C*
two varieties: one resident known as "*Agone*," the other migratory entering
sea in spring, called "*Cheppia*." The Po and Adige are besides periodic
numerous sturgeons (*Acipenser sturio*, *A. huso*, *A. Naccarii*, and *A. Nardoi*),
attain a very large size. *c. Crustacea.* The common crayfish (*Astacus fluvia*
common all over Northern and Central Italy, but of late years it has been near
by a curious epidemic, manifest in an infusorian which fixed itself in countle
the branchiæ, finally preventing respiration. Crayfish-culture has not, it
been attempted in Italy, where it might easily succeed. In Central and S
fresh-water crab (*Telphusa fluviatilis*) is pretty common and sought for; near F
kept for some time in the dark, isolated in earthen jars, so that they shed the
becoming soft are more easily eaten. *d. Vermes.* The common leech (*Hiru*
found in most parts of Italy, was in past years, when more extensively use
purposes, eagerly sought for; between 1828 and 1851, the authorities of Sard
Parma, issued special edicts for its protection. No later documents with t
been noted, but in the neighbourhood of Turin leeches are specially reared for

VI. Pisciculture.—This important branch of industry is as yet in an inc
in Italy, whereas it has of late years made such rapid strides in other count
this, as in many other things, we may and can look further back than mo
recall the time when our forefathers, the Romans, had such tender cares fo
*vivaria murænorum*, and *cetaria*, and reared oysters in Lake Lucrinum,*
thither from the far shores of Brundusium and Tarentum.† Of late, howeve
has been made, and the future promises well. 1. *Fish-culture in Lagoons.*—
peculiar kind of industry, the first step towards true artificial fish-culture; it
sively practised in the salt and brackish-water lagoons which occupy so
between the mouths of the rivers Reno and Isonzo, on the Adriatic coasts, a
generic term of *vallicoltura*. It originated in the peculiar nature of that exter
dates back far into the earlier part of the mediæval times, for in the ar
documents exist relating to lagoon-fishery of Chioggia dated 888. In the yea
*piscariæ aquæ* are mentioned, and in 1425 documents relating to *clausura*
Up to the present time much has been written on *Vallicoltura* in the Ven
but especially the recent concise publications on the subject by Dr. Reni

ns for spawning purposes, and more especially the young fry who enter from the sea in n of food, are thus protected, divided, and at the right time captured. The system of on and subdivision in the *valli*, especially in the inland ones, is very complicated, and is industry is most important and of quite a peculiar nature, I am sorry for want of to be prevented from giving further details. The *valli* are classed into—*valli arginate*, *arginate in parte*, viz., partially closed by reed-palisades (*grisiole*), and *valli chiuse*, or letely closed by *grisiole;* locks or *chiaviche* regulate the communications and the water y. The natural entry of fish-fry from the sea into the lagoons goes by the name of *ta*, and the more important *montate* take place from February to May (*Mugil capito*, *ratus*, *M. chelo*, *Labrax lupus*, *Chrysophrys aurata* and *Anguilla vulgaris*), and in August eptember (*Mugil cephalus*, *M. saliens*, *Mullus*.) A peculiar feature in this industry is o-called "*Semina del pesce novello*," literally "sowing of young fish." It consists in ring in fine nets along the coast or in the external lagoons the young fry of the species mentioned, and in carrying it to the inner waters or closed *valli*, that it may grow and hed at the proper time. The utility and expediency of such proceedings has been for st two centuries an object of discussion amongst the *Vallicultori*, some of whom up to resent day opine that the natural *montata* and its facilitation is the true system of *valli*-re. To give an idea of the value of the present lagoon-fishery and pisciculture, we may he statement of Count Ninni, who in 1881 writes that in the northern lagoons alone een Porto Fossone, Adige, and the mouth of the Isonzo) 600 boats and 25,000 fishermen nployed in this industry; and he adds that these data are rather below the true number oth. Quite a series of boats, nets and implements of various kinds are used in *Vallicol*-and the men therein employed have each their special task. 2. *Fish-culture in Fresh-s*.—I include under this term the artificial propagation and introduction of important lshes; in this line little indeed has as yet been done in Italy. The first attempts were in 1859, in the small lakes of Trana and Avigliana in Piedmont, by Professor F. de pi and Sir James Hudson, then British ambassador at Turin: eggs of lake-trout, Salvelin, Salmon from Hüningen were introduced, and the following year to these were added of *Coregonus* from Lakes Bourget and of Geneva; unfortunately, on account of the ce of Prof. de Filippi, first in Persia, and then in a voyage round the world, during he died, the work was discontinued before any results could be obtained. In 1861 ilippi went to Lake Constance, on purpose to fecundate eggs of *Coregonus lavaretus;* 00 of these were thrown into Lake Como at Colico, and about a million in Lake giore, some being incubated at Avigliana, others at Baveno, with Coste's system. n, in 1862, Government acquired 70,000 fecundated eggs of the Salvelin from Kuffer sburg); 25,000 were kept at Avigliana, 40,000 deposited at Baveno to be placed in Lake ozzo, and 5000 destined for Lake Montorfano (Como). As I said above, these operations ll begun were unfortunately not continued. However in April, 1881, a *Coregonus* of size was caught in Lake Maggiore, evidently one of those introduced from Lakeance. In 1861, at Venaria Reale, H.M. King Victor Emanuel, initiated a small ultural establishment, now obsolete. In 1864–65, Dr. P. Carganico made a similar pt for trout at Como. In 1871 Dr. Revelli founded a piscicultural establishment for and salmon at Savigliano; this succeeded in part, but eventually failed simply for of pecuniary support in 1879. An attempt of a similar nature, on a larger scale, was at Isola della Gaiola near Naples, by a Signor De Negri; this also failed through of money. In 1878 Messrs. Turri and French commenced the artificial propagation of in one of the mountain streams near S. Marcello (Pistoia), and although entirely ndent on their own private means, have been thus far successful. Again the Agrarian nittee of Bardolino (Verona) have decided to found a piscicultural establishment on Garda; on this project the Fisheries Committee reported favourably. Finally, Govern-has begun the formation of a small piscicultural establishment for trout in the Royal stal School at Vallombrosa, in order to impart practical instruction in the matter to students. Before concluding, it should be mentioned that a successful piscicultural lishment has been working, since 1879, at Torbole near Riva (Tyrol). 3. *Oyster- and el-culture*.—The inner sea of Taranto (*Mare piccolo*) and Lake Fusaro, near Naples, h had lost its ancient renown but appears now in a fair way of regaining it, are the

principal centres of oyster-culture in Italy; the species reproduced is *Ostrea edulis*, varieties of which are known. Prof. Targioni Tozzetti calls the Taranto oyster *O. la* The young oysters are collected in the autumn on bundles of branches which h purposely immersed during the preceding spring in suitable localities in the *Mar* at Taranto, weighed down with stones; these young, called *cria*, are inserted int twisted ropes (*pergolari*) made of *Spartium*, which hang from the larger ropes sup piles which form the *sciaja*, such being the name of the quadrangular spaces in t *piccolo* specially allotted for this oyster culture. The oysters thus transplanted a eating after eighteen months or two years, during which the *sciaje* are carefully k These oysters becoming adult spawn, but the young larvæ thus produced do not th the *sciaje* must be kept up by new *cria*, procured, as I have described, in the *Ma* The mean yearly produce of the *sciaje* of Taranto is valued at six millions of oyste from five to six francs the hundred. The Taranto oysters are beyond doubt am finest I have seen and tasted anywhere. A small oyster culture exists also in Lagoon, near Messina. At Taranto again, and also in some of the Venetian *valli*, mussel (*Mytilus edulis*) and, especially at Taranto, the more esteemed *Modiola ba* largely cultivated. In the *Mare piccolo* of Taranto the same system is used as that for oysters. The reserved spaces are, however, called *quadri*, enclosed as the *sciaj* driven vertically down; the bigger ropes are called *libani*, and the dependent sm with free extremities again *pergolari*; the latter usually number nearly 6000 in ea The young mussels, also called *cria*, are carefully collected and inserted into the uncoiled *pergolari*, where they fix themselves with their byssus. In about eighte during which they are carefully kept clean, the *pergolari* being regularly cle parasites, they attain maturity. An average *quadro* may thus produce about 15 grammes of mussels of the approximate value of 17,000 *lire* (francs), including The entire produce at Taranto has been calculated at 16,000 *quintali* per an November, 1881, the writer was at Taranto, and visited the oyster and muss establishments on the *Mare piccolo*, but found their owners in great distress; unusual storms a few days before had committed great havoc amongst the *sciaje* and *qua* those poor people were busy cleansing and repairing. Quite recently my friend Pr Issel, of Genoa, has published by Government order a valuable treatise on oyster a culture (*Istruzioni per l'Ostricoltura e la Mitilicoltura*, GENOVA, 1882).

VII. CONCLUSIONS.—The rapid and synthetical account now concluded has succeeded in giving a fair though very general idea of Italian fisheries. Here an given a few statistical data, but it must be borne in mind that such data ca approximative. I should have wished before concluding my task to have gi statistical data, such being considered now-a-days the best manner of expressing the of industrial undertakings and many other matters, but few will contradict the that of all sources of produce, fisheries are beyond doubt those to which it is m to apply that test, for obvious reasons. During the first session of the Fisheries C I had to report on this very subject, viz., "*How to obtain annual statistics of fi of Fisheries;*" then, as now, my conclusions were that the problem is a most difficult can never be thoroughly solved. I may, however, add some general returns, the res inquiry for collecting materials for the law on fishery between 1869 and 1871, giv for what they are worth. From the report on fisheries then presented to Parliam the following data: The number of men engaged in sea-fisheries on December 3 with the exclusion of the then Papal States, was 60,000, employing 18,000 boats an a mean annual produce valued at 40 millions *lire*. It does not appear that any statis then collected for the important lagoon and estuary fisheries, and the results relating water fisheries are far from complete; they gave the numbers of fishermen at 2000 value of produce at between 3 and 4 millions of *lire*. For the sea-fisheries the be of information were the maritime inscriptions, and they may easily give erroneous r the special object in view. In 1878 the official returns give the following data: *products exported*, 39,887 kilogrammes, value 3,259,670 *lire*; fishery products 44,060,300 kilogrammes, value 21,479,740 lire. These data cannot be much altered show an immense difference in favour of imports, a proof that our consumption is not

produce. At present our fisheries, as an industry, considered *en masse*, cannot be said per, but no doubt better days are in store, and will come for this as for other Italian ts; the actuation of the new law on fishery, and the untiring exertions of Government and protect individual enterprise, cannot but lead to good results. The *bibliography* g to Italian fish and fisheries is rich and extensive; a valuable contribution on that t, was collected by Dr. Cavanna for the Berlin International Fisheries Exhibition in nd published at Government expense.

PROFESSOR HENRY H. GIGLIOLI,
*Commissioner of Fisheries.*

AL ZOOLOGICAL MUSEUM, FLORENCE,
*April* 12, 1883.

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**FRANCATI AND SANTAMARIA**, of Rome, 65 Hatton Garden, E.C. ells. (2) Shell Cameos. (3) Shell Works of Art. (4) Coral ornaments mounted in nd unmounted.

**FALLANI, ORESTE**, 44 Via Bonella, Rome. Shell work, Cameos, and Roman pearls.

**POZZI, VITTORIA**, Via della Vite, Rome. Roman Pearls, Conch and Cameo works, corals, &c.

**CAMPI, ENRICO**, 29 St. Lucia in Selci, Rome. Corals, Roman pearls ell work.

**SANTAMARIA, ANTONIO**, 61 Via Bonella, Rome. Cameos, Sea Corals, and Roman pearls.

**REY, A.**, Babaino, Rome. Roman Pearls, &c.

**MORABITO, ROCCO**, 32 Sta Caterina a Chiaja, Naples. Cut Coral ndry Shell Work, mounted in gold and unmounted.

**LABRIOLA, MARIANO**, 41 Strada Sta Caterina a Chiaja, Naples. rtoiseshell, Coral and Shell, personal and other ornaments. (2) Silver and sculptured ork.

**MELILLO, GIACINTO**, 286 Riviera de Chiaja, Naples. Collections tic Jewellery in Corals, Pearls and Shells.

**CASALTA, LUIGI**, 7 Piazza dei Martiri, Naples. (1) Coral specimens ir rough state. (2) Coral Fine Art Jewellery for personal ornament. (3) Cameo shells ava work (wholesale and retail).

**GIOBERTINI & Co.**, of Naples (successors Giojuzza & Co. (1) Spe- s of rough Coral from various seas. (2) Polished Coral, mounted in gold and set with and diamonds. (3) Pearls. (4) Rosaline Jewellery from shells.

**ASSISI, PIETRO**, of Naples, 332 High Holborn, W.C. Coral mounted lery.

**PREMI, CORNELIO BENEDETTO**, Genoa. Samples of oils at of Tunny of 1878, 1879, 1880, 1881, 1882.

**CRISCUOLO, MICHELE**, 5 Corso Garibaldi a Foria, Naples (repre- l in London by Messrs. G. C. Greck & Co., 9, Rathbone Place, W.). (1) A glass tank ning a representation of the act of coral fishing. The apparatus to which pieces of coral en attached was used in 1882 at Sciacca. (2) The various implements for working coral, ete from beginning to end—first time of exhibition. (3) A large collection of corals of nds from Sciacca, Coast of Sicily, Sardinia, &c. Several very large specimens, one pink, tered the finest yet discovered. (4) Large assortment of worked Coral.

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# JAPAN.

(*See Plan, p.* 26.)

[*Up to the time of going to Press with the Second Edition the Official Introduction to the Exhibits from Japan had not been received.*]

### Division I.

Lines, for Fishing (1) "Tai" (Chrysophyrys major). (2) "Karei" (Plalessa flesus) Codfish. (4) Implements for Fishing Mackerel. (5) "Tamo," Small Bag Net with Ha and "Uchikaki," a kind of fish-hook. (6) Various kinds of Fish-hooks, Fishing Lines Floats. (7) Accessories to the Lines for Fishing Codfish. (8) Fishing Rods.

### Division XXVI.

(1) Mackerel, dried. (2) "Hamachi," a kind of fish, dried. (3) "Tai" (Chrysoph major), dried. (4) Salmon, smoked. (5) Codfish, dried. (6) Sardines, preserved in (7) Tunny, preserved in Oil. (8) Salmon, tinned. (9) "Masu" (Salmon sp.) tin (10) Salmon, preserved in Vinegar.

### Division XXVII.

(1) Cod Liver and other Fish Oils. (2) Fish Wax.

### Division XXIX.

Isinglass, Glue, and Dried Sardine for Manure.

### Division XLIV.

Coral.

### Division XLVI.

(1) Shell of Sea-ear. (2) Oyster, tinned.

### Division L.

Crab, stuffed.

### Division LIV.

Fibre of Whale-bone.

### Class VII.

**LIBERTY & CO.**, Regent Street, London. Artistic Examples in Bron Porcelain, Embroidery, Lacquer Work, Paintings—illustrating various subjects in natu Fishing and Marine Studies.


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(Copy of *Testimonial.*) HOME OFFICE, Sept. 2, 1878.

MESSRS. ANDERSON & Co.—You made me an Oilskin Coat, about seven years ago, which has lasted in capital condition until this year. (Signed) A. V. G. LINDSELL.

# MOROCCO.

*p to the time of going to press with the Second Edition, the Official Introduction to the Exhibits from Morocco had not been received.*]

### Division I.

Moorish Fishing Tackle, Rods, Fitted Lines, Gaffs, Leads, &c. (2) Baskets, various Sole and Turbot Spears. (4) Sundries. (5) Baits, artificial. (6) Baits, natural, in ts. These include mussels, barnacles, octopus, rockworms, prawns, "red bait," small fish. Dams, &c. (Models).

### Division IV.

(1) Moorish Boats (Models), with Crews, &c. (2) Moorish Oars, Killicks, &c.

### Division VIII.

(1) Nets—models and specimens. (2) Palm-leaf floats for Nets.

### Division XXI.

Figure of Fisherman, showing clothing, &c.

### Division XXVI.

Shebbel and other fish, dried and salted for trade.

### Division XLVI.

Collection of Marine Shells and of Freshwater and Land Shells.

### Division LI.

(1) Specimens of Fish (of commerce and curious). (2) Fish of prey.

### Division LII.

(1) Freshwater and land tortoises (alive). (2) Reptiles, in spirits.

### Division LIII.

Birds of Prey, stuffed.

### Division LX.

Pamphlet on Moorish Fisheries. (2) Photographs of Fishing Scenes and Places, &c.

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# NETHERLANDS.

(*For Plan, see p.* 176.)

Herring Fishery.—The principal branch of this great fishery of the Netherlands is carried on in the North Sea annually from the month of June to the beginning of November, its special localities being in the vicinity of the coasts of Scotland and England; also, in the latter portion of the season, in a more southerly direction near the Dutch coasts. In this calling there are occupied a great number of smacks, luggers and cutters, nearly all issuing from the ports of South Holland, besides the so-called "bomschuiten" vessels, which, owing to the necessity for their being dragged along the shore, are furnished with a flat bottom instead of a keel. The fleet after a long period of decline has improved since 1857, when Holland abolished the system of premiums, and put an end to all kinds of protection for the fisheries and left them unrestricted. The number of hookers, luggers and cutters was 89 in 1867, and in 1881 had increased to 139; the number of "bomschuiten" likewise increased from 189 in the former to 269 in the latter year. Besides this the tonnage of the different vessels gradually became larger, so that they now take out to sea more nets than was formerly the case. The tonnage of the luggers gradually increased from 147 to 235 cubic metres, and that of the boats from 90 or 100 to 140 or 150 cubic metres. The luggers and cutters are manned by fourteen or fifteen hands; the boats by ten or eleven. The whole fleet consisted in 1881 of 408 vessels, measuring 19,800 tons (each of 2·83 cubic metres), and were manned by 4840 sailors. The captured herrings are for the most part cured almost immediately after they are taken and on board ship, while another portion are first salted prior to being smoked and sold as red herrings to the trade. The production has of late years remained prosperous, consisting in 1880 of about 227 million, and in 1881 of about 197½ million of fish, representing a market value of between 3 and 4 million guilders. The principal destination of the salted herrings is Germany, the smoked ones being sent to Belgium. Similarly with the production, the export has also remained steady. The export of cured herrings increased from 80,000 barrels in 1872 to 134,600 barrels in 1881 and 139,500 barrels in 1882. The abolition of the official brand to which Holland agreed in 1878, far from hampering the home trade, has given it a remarkable impetus from that period. On the other hand the export of smoked herrings has decreased from about 68 million head in 1872 to 41½ million in 1881. This diminution is however solely due to the circumstance that so high a price is now obtained for the cured herring that a smaller part of the whole capture is now consigned to the smoking room than was formerly the case. Besides those caught in the North Sea, Holland obtains considerable quantities of herrings from the Zuider Zee. This fishery, which begins in the month of October, continues to March or April, but is often delayed for months by frost, keeps perhaps a thousand small vessels in employment, each of which is manned by two or three men, who bring their take daily to the shore. The produce is very irregular, but may be set down at from 40 to 50 million fish. These herrings are of much inferior quality to the herrings from the North Sea. They are either smoked singly, though last year high prices were obtained from them fresh, in which state they are largely used by the poorer classes. If the capture is a very large one, large quantities of them are often used for manure.

Salt Cod.—The smacks and cutters which in the summer carry on the herring fishery are occupied during the winter in the capture of codfish with hooks and lines in the vicinity of the Dogger Bank, the cod being principally prepared as salt fish. The not very profitable results obtained from this fishery—a consequence probably of the high price of the bait—is no doubt the cause why many of the ships during winter either lie still or engage in the capture of *fresh* fish. On the contrary there are in Holland about fifty other vessels, each with a crew of thirteen men, which carry on exclusively the capture of cod and shell-fish, and during a part of the winter, join the fleet which fishes on the Dogger Bank and bring away the salted produce. The returns of this fishing has of late years varied between 20,000 and 25,000 barrels, while the export of salted cod amounted in 1881 to 575,000, and in 1882

arly 894,000, kilogrammes; Belgium and Germany are almost exclusively the consumers is article.

FRESH FISH.—Next to the herring fishery the capture of fresh fish is the principal one in nd. The fish are sometimes caught with hooks, but more frequently with trawls and drag nets. In this fishery all the "bomschuiten" of the coast take part during the r, and some of the luggers which carry on the herring fishery in summer; also the fifty vessels referred to above, and all sorts of other vessels great and small hailing from the towns along the coast.

ie complaint of scarcity, especially in regard to flat fish, becomes gradually more general, should be noted on the other hand that extravagantly high prices are obtained for fresh o that the prosperity of fishermen is now on the whole greater than was formerly the A great part of the fish is exported, more particularly for Belgium. In the last three the following quantities were exported:—1880, 6,959,000 kilos.; 1881, 4,800,000 kilos.; 4,311,000 kilos. These figures however do not include the export of shrimps, which 32 mounted to 1,178,000 kilogrammes, nearly all of which quantity was sent to England. e Zuider Zee are caught, in addition to herrings as above stated, anchovies, plaice, rs, and shrimps. The anchovy fishery, which, from May to July, employs some 1200 is in fortunate years the richest product of the Zuider Zee. The harvest is however nely uncertain, for while in abundant years it sometimes amounts to over 70,000 baskets of about 3,500 fish, in poor years the whole may be put down at 1000 baskets. During st six years the catch has been extremely small.

CULTURE OF SHELL-FISH.—Oyster breeding in the province of Zeeland, until lately un-tant, has during the last fifteen years increased considerably, thanks to the particular estowed on the enrichment of the beds and the high price obtained for the produce—e years from 60 to 65 guilders per 1000. In 1881 21,800,000 oysters were brought to t, half of which quantity was sent to England while the other half was either retained me consumption or sent to the Belgian and German dealers. Next to that of oysters, oduction of mussels is very important, both in Zeeland and in the Zuider Zee. From st-named sea there were sent, in 1881, to England, *viâ* Harlingen, 11½ million kilo-nes of this shell-fish.

ALMON FISHERY.—The fishery of salmon in the Dutch rivers is now in a very satisfactory tion, not only on account of the rich catches, but also in consequence of the very high obtained for the supplies. At Kralingen, a village in the neighbourhood of Rotterdam, is the centre of this trade, there were sold in 1882 55,079 head. The prices fetched from about f. 7 to f. 1 per kilogramme. The greatest harvest in the last decade was in 77,070 head), the lowest in 1879 (38,914 head).

FUNDS FOR FISHERMEN.—At the principal fishing ports there exist funds called "rents" e maintenance and education of the widows and orphans of fishermen who are ed. These funds are partly kept up by voluntary contributions, and partly by butions by masters of vessels and by fishermen.

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DIVISION I.

**COMPANY FOR SEA FISHERIES**, Maassluis: Manager, Ch. (1) A rigged Trawl Net, with pit-rope. (2) A ditto. (3) A Loose Pit. (4) A nd Line, with wide rigged hooks. (5) A ditto, with close rigged hooks. (6) A Basket, baited fishing lines. (7) A Buoy and Grapnel Line, for groundline fisheries. (8) A for groundline fisheries. (9) A Grapnel. (10) A Gaff. (11) Model of a Lamprey at a quarter of the real size. (12) A ditto. (13) A Deep Sea Hand Line, with lead, s, and basket. (14) A Rest for Same. (15) A Herring Net, for bait fishing. (16) A -rope of Manilla Hemp. (17) A ditto (Cotton). (18) A Bowl. (19) A Head Bowl Used Herring Nets, (1) mounted and rigged, ready for fishing; (2) unrigged.

**SMIRREN, J. VAN**, Vollenhoven. (1) Pit Net. (2) Flounder Net. (3) Herring Net. (4) Silk Flounder Net. (5) Silk Smelt Net, for fishing under e. (6) Two Herring Bow Nets, with three side nets. (7) A Silk Perch Net.

**WUYSTER, M.**, Maassluis. (1) A Herring Net, mounted and rigged 76 and since used every year. (2) Herring Net used since 1877. (3) Used since 1878.

(4) Used since 1879. (5) Used since 1880. (6) Used since 1882. (7) A part of a Back Rope, sufficient for six herring nets, fixed to the warp. (8) An ordinary and a painted Head Bowl. (9) Six Ground Lines, with hooks and bait basket for cod fisheries. (10) *Herring Casks.*—A Set of Casks as used for salting and packing the Dutch herrings as: 1/1, 1/2, 1/4, 1/8, 1/16, 1/32, 1/64, and a small one for 6 herrings. (11) Two Casks (Scotch model), all made by the Exhibitor, and exclusively for his own use.

4. **HOFLAND EN ZOON, J.,** Brielle. (1) A Trawl Line. (2) A Bridle for Luggers. (3) A Heavy Warp. (4) A Light ditto. (5) A Trawl Rope. (6) A Hawser. (7) Two Bridles for Bomboats. (8) Two parts of a Bridle for Bomboats. (9) A Seam for Herring Nets. (10) Three parts of a Back Rope—one unprepared, one tanned, one tarred. (11) A Piece of Seizing (light). (12) A Piece of Seizing (stronger). (13) Two Manilla Ropes, for raising and lowering the mast. (14) A Buoy Line. (15) A Stay for Bomboats. (16) A Set of Shrouds. (17) A Bowl Rope, Manilla hemp. (18) Three Splice-Pins. (19) Two Tanned Ground Lines for Cod Fishery. (20) Two Tanned ditto, Italian hemp. (21) Two Tanned ditto, Dutch hemp. (22) Two Hanks of Dutch hemp.

5. **GROEN, W.,** Blacksmith, Scheveningen. (1) A Complete Trawl Net for Sole Fishery, with beamheads of the Exhibitor's invention. The size and form of the net are in all parts according to the backnet used by the bomboats of Scheveningen. (2) A Hand Net used in herring fishing. (3) A Double Grapnel. (4) An Anchor with Four Flukes. (5) A Common Anchor. (6) Two Blocks of Galvanized Iron, for lowering and hauling the bomboats. (7) An Iron Hauling-hoop with Peg and Iron Pin.

6. **MAAS, A. E.,** Scheveningen. (Nets in different stages of preparation.) (1) Four Nets, 15-29, 720, unprepared. (2) Two ditto, once tanned with cachou. (3) Ditto, twice tanned with cachou. (4) Ditto, three times tanned with cachou. (5) Ditto, four times tanned with cachou. (6) Ditto, five times tanned with cachou. (7) Ditto, five times tanned with cachou, and once in linseed oil.

7. **GROENEWEGEN, A.,** Maassluis. A Herring-net used for several years.

8. **GALEN, B. van,** Yarn and Twine Manufacturer, Gouda. (1) 60 Turns 4 Twists Trawl Yarn. (2) 80 ditto. (3) 100 ditto. (4) 120 ditto. (5) 130 ditto. (6) 160 ditto. (7) 100 Turns 3 Twists Drag Yarn. (8) 120 ditto. (9) 150 ditto. (10) 180 ditto. (11) 200 ditto. (12) 250 ditto. (13) 300 ditto. (14) 350 ditto. (15) 375 ditto. (16) 400 ditto. (17) 450 ditto. (18) 300 Turns 2 Twists Weel Yarn. (19) 350 ditto. (20) 400 ditto. (21) 450 ditto. (22) 500 ditto. (23) 550 ditto. (24) 600 ditto. (25) 200 Turns 3 Twists Seam Yarn. (26) 250 ditto. (27) 300 ditto. (28) 400 ditto. (29) 500 ditto. (30) 600 ditto. (31) 700 ditto. (32) 800 ditto. (33) 1000 Turns 2 Twists Yarn for Pike Nets. (34) 1000 Turns 3 Twists Yarn for Pike Nets. (35) Sail Twine, No. 1. (36) Ditto, No. 2. (37) Ditto, No. 3. (38) Fishery Hook Lines. (39) Ground Lines. (39) Mackerel Hook Lines. *Hatcheled elements.*—(40) Hemp Dutch (i.). (41) From the Baltic Sea (ii.). (42) Italian (iii.). (43) Dutch Flax (i.) blue; (ii.) white.

9. **BOUWMAN, D.,** Cord and Twine maker, Moordrecht. (1) A Bunch, 80 turns, Trawl Twine, 42 strings, Dutch hemp. (2) Ditto, 60 ditto. (3) Ditto, 100 ditto, Drag Twine ditto. (4) 5000 Cord-Nosings, Manilla hemp. (5) 5000 Single, ditto. (6) 50 Manilla Hemp Strings. (7) 50 Dutch ditto. (8) 5 Hanks, 200 turns, Salmon Twine, Dutch hemp. (9) 5 ditto, 250 ditto. (10) 4 Clews tarred light Sea Line. (11) 4 ditto heavy ditto. (12) 5000 Strings Dutch Hemp. (13) 5 Strings Say Yarn, 300 turns. (14) A Bunch, 120 turns, Drag Twine for Pits.

10. **BOTTEMANNE, C. J.,** Bergen-op-Zoon. (1) A Rocket Shell Harpoon Gun. (2) A Rocket-Shell Harpoon. (3) A Drawing of No. 1 Section. (4) A Drawing of No. 2 Section.

11. **LEEUWEN, D. VAN,** Basket-maker, Scheveningen. Baskets: (1) A Sole, with cover, white; (2) Ditto, brown; (3) Turbot, with cover; (4) small Cod-fish; (5) large Cod-fish; (6) Two, for washing Herrings; (7) Spit; (8) white; (9) fine white; (10) white Red Herring with cover; (11) brown ditto; (12) small (half-size) white Herring with cover; (13) ditto brown ditto.

WATERPROOF CANVAS

**BAGS, HOLDALLS, AND KNAPSACKS**

of every description for Travellers and Sportsmen.

**ANDERSON, ABBOTT, AND ANDERSON,**

37, Queen Victoria Street, London, E.C.

2. **LINDNER, J. A.** (Firm: Kacks van de Velde and Co.), Amsterdam. ts: (1) Cork, for Silk Nets; (2) Round; (3) Square; (4) Small; (5) Salmon Net; Lugger.

3. **MAAS, A. E.**, Scheveningen. A Used Shrimp Net with Beam and ready for Fishing.

4. **"NEPTUNUS" COMPANY**, Nieuwediep. Model of a Lamprey-

5. **POLLEN, DR. FRANÇOIS P. L.**, Scheveningen. A Drag-net, gear, as used by the Bomboats of Scheveningen.

5. **BOUMAN, T.**, Basketmaker, Maassluis. (1) A Lamprey Cawl. A Lamprey Basket.

DIVISION II.

7. **BOTTEMANNE, C. J.**, Bergen op Zoom. An Oyster Dredge for water, not liable to foul.

3. **DIRECTION OF THE FISHERIES ON THE RIVER ELDE**, Bergen op Zoom. (1) A Mussel Dredge. (2) A Mussel rake. As they may sed according to the regulations in Zeeland.

DIVISION III.

). **ROYAL COMMISSION FOR SEA FISHERIES.** A Drawing senting an iron fish-lugger.

DIVISION IV.

). **ROYAL COMMISSION FOR SEA FISHERIES.** Model of a Fishing Boat.

. **WUYSTER, M.**, Maassluis. Drawing: (1) Fisher-boat "Schokker," g with the common smelt net; (2) The same fisher boat at anchor, drying the nets at water; (3) Bownet fishery; (4) Fishery with nets.

2. **ROYAL MUSEUM "PRINS HENDRIK,"** Rotterdam. (1) el of Bom-Boat. (2) Ditto (Hoekerschip). (3) Ditto Fisher-Boat (Dutch: Botter).

3. **SMIRREN, J. VAN**, Vollenhoven. Model of a Fisher-Boat rally used on the Zuyder Zee (Schokker).

4. **STERRE, J. S. VAN DER**, Vlaardingen. (1) Model of a Fishing (Sloop). (2) Description of the Model of Sloop Fishing-Boat, "Nyverheid," made of the size of original by J. S. van der Sterre, Ship-builder, Vlaardingen. This kind of of which fourteen are found at Vlaardingen, is used for herring and ground-line ries, and may be distinguished from the luggers:—1. Their depth of hold is 1½ ft. larger those of the luggers. 2. That the bow is fuller built. 3. That the manner of building ite different from that of the luggers, and the different parts are stronger; for instance, draughts are closed and fixed together on the keel as well as in the hold, while the fence mposed of two-inch oak wood outside and inside, by which it is very rare that they are away by the sea, which happens frequently with the luggers. 4. Another difference is they have a trunk or box to keep the fish alive; the holes in the bottom of the ship are amed with stopples when the ship is used in herring fisheries. With a few exceptions the can be taken down. This kind of fisher-boat is a development of the old-fashioned ps, which were built with a flat poop placed upright against the stern, and which are still se in some places for the ground-line fisheries only. The great advantage of this alteration that it gave more room for the mizen mast with rigging and sails.

5. **YZERMANS EN CO.**, Vlaardingen. Drawing of a Fisher-Boat: ekerschip."

**ANDERSON, ABBOTT, & ANDERSON'S**
**FISHING STOCKINGS AND BROGUES**
VERY LIGHT.] **ALL IN ONE.** [VERY STRONG.
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26. **"NEPTUNUS" COMPANY,** Nieuwediep. Small flat-bottom Fishing-Boat, with fishing nets and gear as used for herring fisheries on the Dutch coast.

27. **KNOL, G.,** Middelburg. Model of a Fisher-Boat: "Hoogaars," generally used on the river Schelde.

28. **ROYAL COMPANY FOR SHIPBUILDING AND ENGINE MANUFACTORY, "THE SCHELDE,"** Flushing. (1) Model of a Fishing Boat (Vischbunsloep) for Ground-line Fisheries. (2) Model of a Fisher-Boat (Hoogaar). (3) Drawing of the Sails as used on No. 1.

29. **BOTTEMANNE, C. J.,** Bergen op Zoom. (1) Model of a Fishing Boat (Dutch: Weêr) for Herring and Anchovy-Fishing, as used on the East Schelde. (2) Model of a Fishing Boat (Dutch: Hengst), commonly used for the Mussel Fishery, and worked generally by one man. This kind of boat is also used for shrimp-fishing on the East Schelde. (3) Model of a Fisher-Boat (Dutch: Schouw), was formerly very much used on the East Schelde river, but is being gradually superseded by the boat called "Hoogaar." (4) Anchovy-Fishing on the Zuyder Zee with two fishing-boats (botters) with particular shaped nets. This kind of fishing is only allowed for three months in the year.

30. **MAAS, A. E.,** Scheveningen. Model of a Cutter (Dutch: Mackotter) $\frac{1}{27}$.

DIVISION V.

31. **PLANTEYDT, S.,** Krommenie. (1) A full Piece of Canvas 33 meters long, 0·80 metres broad. (2) A full Piece of ditto, A 33 × 0·77³ meters. (3) Ditto, A B 33 × 0·77 meters. (4) Ditto, P 33 × 1·12 meters. Carded and hand woven from Italian hemp, and bleached without chlorine. (5) A full Piece of Canvas, 33 × 0·80 meters. (6) Ditto, $\frac{AA}{M}$ 33 × 0·77³ meters. (7) Ditto, A B K 33 × 0·77³ meters. (8) Ditto, L 50 × 0·77³ meters. (9) Ditto, B 50 × 0·77³ meters. Made from foreign hemp, machine carded and hand woven, bleached without chlorine.

DIVISION IX.

32. **BOTTEMANNE, C. J.,** Bergen op Zoom. Model of a Life Boat with Rocket-gun, for throwing a line over a wrecked ship without assistance of the ship's crew.

33. **MAAS, A. E.,** Scheveningen. Model of a Life Boat invented by the Exhibitor. Built in this way the boat is ballasted by water and cannot capsize.

34. **ZACHARIASS, L. M.,** Helder. Model of a Life Boat. According to the opinion of different sailors at the Helder, a lifeboat of this model can more readily be used in the surf on the sandbanks because she is flat-bottomed, and passes more easily over the outer sands. At the same time there is no difference between the poop and stern which makes turning needless, and thus lessens the chance of capsizing. Instead of turning the boat goes astern while every oarsman takes the seat of the man before him and keeps his oar. The boat is provided with boards for victuals, marked A and B. $\frac{1}{10}$th of the price prize 200 guilders (Dutch currency) full size.

35. **LINDNER, J. A.** (Firm: Kacks van de Velde & Co.), Amsterdam. (1) Life Buoy Mattress, weight 3 kilog.; fit for bearing three persons; with a receptacle for victuals. (2) Life Buoy, in Linen, weight 1·7 kilog.; fit for one person. (3) Life Buoy, weight 2·6 kilog.; fit for bearing 11 kilog. of iron after 24 hours' submersion (two men). (4) Lindner's Life Buoy, weight 3·5 kilog.; fit for bearing 14 kilog. of iron after 24 hours' submersion; with a receptacle for victuals. The bread in the boxes of Nos. 1 and 4 is prepared in a special way, so as to hold nearly nothing but nutritious elements; and is made by Messrs. de Jonge and Doorakkers, Ships' Biscuits Manufacturers, Oude-Zijds voor burgwal te Amsterdam. (Keeps three years when preserved in tin boxes.)

**FOR STEAM JOINTS.**

**PERRONCEL'S Patent Plastic Compound Sheet (called Leather Felt) is employed by the French Government, the Principal Railways, and Transatlantic Steamboat Companies, &c. Unequalled for immediate application, without waste to any steam joints, and equal to the severest tests.**

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INDIA RUBBER MANUFACTURERS,

**37, QUEEN VICTORIA STREET, E.C., LONDON, ENGLAND.**

DIVISION XIII.

5. **WUYSTER, M.**, Maassluis. (1) Pit part of a Salmon Seine Net, the middle net, and on both sides one set of two nets' length. This part of the Seine net larged at both sides, with as many nets as allows the position of the fishing water. The of joining is very simple; the nets are laced together, the cork and ground-ropes are tied her. (2) A Pocket or Pit of a Seine Net. The enlargement is made in the same way as lmon Seine nets. (3) Two large Salmon Bow Nets (used nets). (4) Two small ditto. A winter Salmon Drift Net (used net). (6) A Summer ditto. (7) A Shad Net (new). A Drift Net, for small size fish (used). (9) A Flounder Drift Net. (10) Six Ground s, for Deep Water Flounder Fishing, with snoods and hooks. (11) A Basket for Baited nd Lines. (12) Two Eel Nets (used). (13) Three Pits for Eel Bow-Nets. (14) A Can eeping Eels. (15) Four Lamprey Nets with Weel. (16) A Square Fishing Net (parti- shaped model). This net is knitted as a round one from the beginning, and is squared e ability and intelligence of the knitter by diminishing the stitches. (17) A Smelt ng Line.

. **MAAS, A. E.**, Scheveningen. (1) A Cotton Seine Net, Large, tanned. Ditto 2nd size. (3) Ditto 3rd size. (4) Two Drift Nets for Salmon and Shad.

DIVISION XIV.

. **DIRKZWAGER, N.**, Cord and Twine Maker, Moordrecht. Ropes sed in Salmon Fishing, 180 meters, for landing the nets. (2) Nine meters of the same ial. (3) Used in Salmon Fishing, 90 meters. (4) Nine meters of the same for trial. Ditto used in Salmon Fishing, 180 meters. (6) Six Small Lines (hook lines) used in on Fishing, 72 meters. (7) Two Clews of Tuggel, used in Salmon Fishing, 108 meters ix Hanks of Yarn for Salmon Nets; 100 turns of Dutch hemp. Ditto (9) 140 turns utch hemp. Ditto (10) 180 turns of Dutch hemp. Ditto (11) 200 turns of Dutch . Ditto (12) 250 turns of Dutch hemp. (13) Two parcels of Dutch Hemp. (14) parcel of Hatcheled Dutch Hemp. (15) One Sheaf of Dutch Hemp. (16) Six Hanks of Dutch Hemp; 140 turns, machine-carded, hand-woven. Ditto (17) 200 turns, ine-carded, hand-woven; Ditto (18) 250 turns, machine-carded, hand-woven.

DIVISION XVI.

. **MAAS, A. E.**, Scheveningen. (1) A Drag Net. (2) Cotton Square with wooden cross and gear. (3) Ditto, with iron frame for bait fishing. (4) Ditto, with for bait fishing. (5) A Hemp Yarn Fishing Net, with gear. (6) Eight Hemp Yarn for pike-fishing. (6) Nets: Two Perch, new, tanned. (8) Ditto, Two, untanned. (9) Bream.

. **SOOS, G.**, Gouda. (1) Two Rigged Seine Nets, for pike fishing, d. Allow fishing at two meters depth,—length 12 meters. (2) Two Common Fish Nets, ver fisheries, tanned, length 12 meters. (3) A Square Net, four square meters, tanned, cross and pole. (4) A Triangular Bait Net, 1·5 meter, with wooden cross and pole, d. (5) A Pike or Tench Weel, with four wings, tanned, Dutch hemp, length 5·5 meters. A Tench Weel without wings, tanned, Dutch hemp, length 1·5 meters.

DIVISION XVII.

. **KOLK, J. VAN DER**, Kampen. (1) An Eel Weel, one wing. Ditto, two wings. Both covered with paraffin varnish.

. **VLIET, W. F. VAN** (Basket Manufacturer to the Court), 158 Heinde, the Hague. (1) An Eel Weel, with loose pits and wings. (2) An Eel Trunk. Perch Basket. (4) Smelt Basket. (5) Sole Basket.

. **VISMAN, J.**, Isle of Texel. A Silk Eel Weel.

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IN THE WORLD.

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44. **SOOS, G.**, Gouda. (1) A Small Seine Net, tanned and with leading poles, length 12 meters. (2) Cotton Eel Weel, with three wings, untanned, length [illegible] meters. (3) Ditto, with two wings with corks and leads untanned, length 7 meters. (4) Ditto, with one wing, untanned, 4 meters. (5) Ditto, tanned, 4 meters. (6) An Eel Weel, with two wings, with ground and drive riggings, untanned, made with first quality cord [illegible] 5·5 meters.

45. **SMIRREN, J. VAN**, Vollenhoven. (1) Two Eel Weels. (2) An Eel Pit. (3) A Float Cork for Eel Fishing. (4) A Hook for Pike Fishing.

46. **MAAS, A. E.**, Scheveningen. (1) A Cotton Eel Bow Net, with two wings and loose pit. (2) Ditto. (3) Ditto, small size. (4) Ditto, one wing. (5) Ditto, with pit attached. (6) Four Separate Pits. (7) A Cotton Cast Net. (8) Ditto, smaller stitches. (9) Four Tench Nets. (10) Three Cotton Landing Nets. (11) Three Hemp Yarn Landing Nets. (12) Three Angling Rods of Portuguese cane with Angling Lines. (13) Two Angling Rods with Lines for smelt fishing. (14) A Hemp Yarn Bow Net. (15) Ditto, smaller. (16) Two ditto, with loose pit. (17) A Hemp Yarn Bow Net, attached pit. (18) Ditto, one wing. (19) Two Tench Nets, with wings. (20) Two Tench Tanks. (21) A Trident Eel Spear, with pole. (22) Ditto, used. (23) Two Hemp Yarn Bream Nets. (24) Two Nets, for small size fish. (25) Two Perch Nets.

## Division XIX.

47. **VLIET, W. F. VAN** (Basket Manufacturer to the Court), [illegible] Noordeinde, the Hague. (1) A Large Fish Basket or Creel. (2) Hand Basket for Anglers. (3) Ditto, for Seine-net fishing or dorser. (4) Ditto, for square-net fishing. (5) Ditto, for Anglers. (6) Easy Chair for watering-places and Anglers. (7) Ditto, covered. (8) Ditto, with Fish Gear. (9) Ditto, "causeuse."

## Division XX.

48. **WUYSTER, M.**, Maassluis. (1) A Drawing, representing Salmon Fishing, with Bow Nets. (2) A Drawing—"Salmon Fishing with particular shaped Bow Net."

49. **COMPANY "NEPTUNUS,"** Nieuwediep. A Fish Trunk.

## Division XXI.

50. **LE POOLE, J. and A.**, Leiden, Manufacturers of Stuff for flags. (1) One piece 4 br. Red. (2) ditto White. (3) ditto Blue. (4) ditto $\frac{3}{4}$ br. Red. (5) ditto White. (6) ditto Blue. (7) $\frac{5}{8}$ br. Blue. (8) ditto half a yard broad, Blue. (9) ditto Blue. (10) ditto, $\frac{3}{8}$ of a yard, Blue. (11) ditto, lighter stuff $\frac{3}{4}$ of a yard, Red. (12) ditto, White. (13) ditto, $\frac{3}{4}$ Blue.

## Division XXV.

51. **COMPANY "NEPTUNUS,"** Nieuwediep. Model of a Smoking Chamber for Herrings.

52. **CARPENTER'S SCHOOL**, Harderwyk. Model of a "Harg" for smoke-drying Herrings, at $\frac{1}{16}$ of the real size.

## Division XXVI.

53. **KIKKERT, H.**, Vlaardingen. Salted Herrings, catch of October 1882. Superior quality.

54. **YZERMANS EN CO.**, Vlaardingen. Salted Winter-Herrings. *The Hooker.*—In sending a sample of our Hooker-herrings, caught last summer, to the Fisheries Exhibition at London, we beg to add some details concerning the Dutch Herring Fishery. Formerly, vessels called Buizen (Doggers) were used, which were superseded by Hookers; but since (about) 1866 Loggers (Luggers) are the vessels which now nearly universally carry on the fishing. These being of a finer construction make quicker voyages, and

Gentlemen's Ventilated Waterproofs
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ore adapted for the work than Hookers. When Hookers flourished, strict laws regulated erring fishing, fixing the date of departure of the ships on the 15th of June which was "Burzendag," and the previous Sunday was called "Vlaggendag," when the whole lying in the harbour, fresh painted and flags gaily flying, presented a holiday appear- thousands gathering together from the neighbouring towns and villages to admire them, ssing the general interest in the national enterprise. On the day appointed the vessels for the Shetland Isles, but were not allowed to cast the nets before the 24th of June. irst take of Herrings by the fleet was sent home by the "Jager," a vessel noted for fast g and hired for that purpose by the owners of the Hookers. Its safe arrival gave rise to rejoicing, and from the Herrings first landed, presents were sent to H.M. the King, and ers of the royal family. Banquets were held, of which Herrings formed the principal and even poets sang their praises:—"Who first between his teeth The dainty morsel Enjoys a glorious treat." The first Herrings frequently brought 700 guilders (about per barrel, and were sold by small quantities from 2s. to 3s. a piece; in the year 1815 rst 195 barrels were sold for fr. 41,414—rather over £3450—thus averaging about £17 arrel. The laws regulating the time of fishing having been abolished, every one is free mmence when he thinks best; owing to the enormous supply the average quantity it by Luggers is double that formerly caught by Hookers, to the greater advantage of wners, as well as increasing the supply for general consumption. The Herrings caught ookers in the North Sea (58°–60° Lat.) and prepared in the old Dutch manner, *i.e.* gutted alted on board, are acknowledged to be much superior in quality, being more tender and than all other kinds, preserving their agreeable flavour even till the following year. lshing in these latitudes requires much patience and time, because the best Herrings are ways plentiful there during the summer. The wages of the crew or men engaged in uggers being a percentage of the amount realised, they prefer quantity to quality; but engaged on board the Hookers receive wages, thus adding to the trouble and expense of equipment. Our firm is the only one in Holland having a Hooker engaged in the ng fishing on the old principle. It is only owing to the rarity and value of Herrings brought to shore, that we generally realise double the price of Lugger-caught Herrings, hus are repaid for our extra trouble and expenses.

. **TEN HOUTEN EN DE RAADT,** Kralingsche veer. (1) Fresh moked Salmon. (2) Oysters.

. **SMIRREN, J. VAN,** Vollenhoven. (1) A Bottle of Shrimps, in ar. (2) Ditto, in salt. (3) A bottle of preserved Eels. (4) Ditto, Anchovy.

## Division XXXV.

. **DUTCH SOCIETY FOR PROGRESS AND IMPROVE-NT OF OYSTER CULTURE,** Bergen-op-Zoom, province of Zeeland. (1) Five ls of Oyster Tanks in Zeeland. (2) Different Apparatus for Keeping Young Oysters series). (3) Tiles prepared for Collecting Spat. (4) Dredges for Oyster Fishing. mplements, viz.—(*a*) Different sorts of Knives for detaching the young oysters from the ed tile. (*b*) Tile Scrapers. N.B.—When the young oysters have been detached, the are scraped clean to serve anew. (*c*) Tanks to hold the clean tiles for immersion in halk mixture. (*d*) Shovel, as used in the tanks for shifting and manipulating oysters le.

. **FISHERIES COMPANY "DE WEMELDINGSCHE COM-NIE,"** Wemeldinge, Zeeland. (1) Frame-shaped Collectors, with stone "cornishes," in oyster culture. (2) Iron Board for Brood Oysters, used instead of the wooden ones amaged young oysters.

. **MASSEE, J. C., & SON,** Goes. A Set of Zinc-Pans for Oyster-l.

. **NOORDHOEK HEGT, J.,** Apeldoorn. (1) Model of the Locality lmon Breeding. (2) Gratings for the Salmon-Eggs. (3) Plan of the whole Locality repre- ng the situation of about 50 streams and 90 fish ponds, nearly all in use. (4) Salmon *o salar*), cultivated at the "Zwaanspreng," of different ages (in spirit) viz.—(1) Salmo-

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salar Salmon, 4 years old. (2) 3 years; (3) 2 years; (4) 1 year; (5) 9 months; (6) 6 months (7) 3 months; (8) 1½ months; (9) 3 weeks; (10) 1 day; (11) breaking shell. (5) Salmon from California (*salmo quinat*), in different sizes, with the young fish (in spirit) viz.—(1) Salmo quinat, Californian Salmon, 4 years old; (2) 3 years; (6) Trout of different sizes and young fry of the same; second brood from "Zwaanspreng" (in spirit) viz.—Trutta Lucustris (1) 3 years; (2) 2 years. Trutta fario, Brook Trout (1) 3 years; (2) 2 years. Ditto, Common Trout, (1) 3 years; (2) 2 years; (7) Trutta trutta, Salmon Trout, 2 years. (8) Californian Trout (*salmo fontinalis*), viz.—Salmo fontinalis, American Trout, 2 years. Ditto, 1 year old. (9) List of Eggs or Ova; Salmo salar. Salmo quinat. (1) Trutta lacustris. (2) Ditto, fario. (3) Ditto, Trutta. (4) Ditto, fontinalis. All the fish named in this list were hatched and reared at the Establishment *Zwaanspreng at Apeldoorn in the Netherlands.* Established 1878. The following reproductions have been obtained, viz.—Salmo quinat, Salmo fontinalis, Trutta fario and hybrids.

## Division XXXVI.

**61. MAJU,** Amsterdam. (Microscopic specimen, showing the gradual development of the Salmon.) The Embryo (1) just appearing. (2) Aged four days. (3) Seven days old. (4) Twelve days. (5) Sixteen days. (6) Twenty-five days. (7) Thirty-five days. (8) Forty days. (9) Forty-three days. (10) Remarkable aberrations.

## Division XL.

**62. DUTCH SOCIETY FOR PROGRESS AND IMPROVEMENT** of Oyster Culture, Bergen-op-Zoom, Province of Zeeland.* A Collection (in liquor) of the Fauna of the River Schelde (Zeeland), collected and prepared by Dr. P. P. C. Hoek and Dr. R. Horst of the University of Leyden.

**63. ZOOLOGICAL SOCIETY OF THE NETHERLANDS.** (Established at Rotterdam, May 15, 1872. Statutes approved by Royal decree of March 16, 1876, No. 32.) (1) *A. Specimens in Alcohol.* Collection of Fishes belonging to the Dutch Fauna and collected along the sea-coasts of the Netherlands, and in Dutch rivers, lakes, etc. Collection of invertebrate Animals, belonging to the Dutch Fauna. (2) B. Model of the Zoological Station of the Zoological Society of the Netherlands. The building was constructed in 1876, and has been used for zoological investigations during the summer months of four consecutive years. The building was taken down every autumn to be rebuilt towards the summer of the following year. The station was erected at the following places respectively:—In 1876, Helder; in 1877, Flushing; in 1878 and 1879, the Island of Terschelling; in 1880, Nieuwediep; in 1881 and 1882, Bergen-op-Zoom. (3) C. Large Diagrams. The Interior of the Entrance to the Station. The Appparatus for circulating Water in the Tanks, as they are in use at the station. Horizontal and Vertical Sections of the Station. Representation of the Anatomy of the Oyster, in six figures, according to the latest investigations made in the station. Representation of the Embryology of the Oyster, in six figures, according to the latest investigations made in the station. (4) D. Publications of the Netherlands Zoological Society. The Journal of the Society. Vol. I.-V., 1874-1881. Vol. VI. I, 1882. Supplementary Vol. I. of the Journal. First Part. Report of the Investigations relating to oyster-culture. (Dutch and French text.) First-Seventh Annual Report of the Zoological Station of the Netherlands Zoological Society, 1876-1882. (5) E. Collection of books and Papers, published in the Netherlands by Dutch authors, important for the Fauna of the Dutch rivers and seas.

## Division XLVI.

**64. DUTCH SOCIETY FOR PROGRESS AND IMPROVEMENT OF OYSTER CULTURE,** Bergen-op-Zoom, province of Zeeland. (a) Tiles with adhering Spawn. (*b*) Living Oysters. (*c*) Sundries.

**POLLEN, DR. FRANÇOIS P. L.,** Scheveningen. V. Conchylia from Madagascar. (1) Cytherea lineolata, Sow. (2) Tapes, geographica, Chemn. (3) Cytherea divaricata, Lam. (4) Arca maculosa, Reeve. (5) Arca Sp. (6) Arca velata, Sow.

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'erna rudis, Reeve. (8) Bulla striata, Brug. (9) Haliotis nebulata Reeve. (10) ianella aethiopica, Phil.? (11) Cyclostoma vittatum, Sow. (12) Cyclostoma Michaudi, l. (13) Turbo fraconicus, Reeve. (14) Nerita undata Linné. (15) Nerita polita, é. (16) Nerita Rumphii, Reel. (17) Melania mitra, Reeve. (18) Cyclostoma Sowerbyi, (19) Achatina panthera, Fer. (20) Ampullaria nsp.? (21) Cerithium asperum, . (22) Fusus Toreuma, Reeve. (23) Terebra monilis, Quoy. (24) Terebra oculata, (25) Mitra vulpecula, Lam. (26) Conus mutabilis, Chenum. (27) Conus guber-, Brug. (28) Conus textile, Linné. (29) Conus verriculam, Reeve. (30) Cypraea Linné, *a*, *b*, and *c*. (31) Cypraea caurica, Linné. (32) Cypraea cernica, Sow. (33) irisaus, Lam. (34) Oliva elegans, Lam, *a* and *b*.

DIVISION XLIX.

5. **KOLK, J. VAN DER,** Kampen. (1) Some Specimens of Water ts spoiling the nets in rivers. (2) Gammarus Pulex L. and Lemmopholus rhombicus L.

DIVISION L.

5. **POLLEN, DR. FRANÇOIS P. L.,** Scheveningen. IV. Crustacea Madagascar. (1) Eriphia Smithii, Mackley. (2) Neptunus madagascariensis, Hoffm. The Forceps of Neptunus madagascariensis, viewed from above. (4) Ditto, viewed from . (5) Thalamita Helleri, Hoffm. (6) Second Pair of Legs of Palaemon mayottensis, n. (7) Palaemon mayottensis, Hoffm. (8) Palaemon alphonsianus, Hoffm. (9) Second of Legs (left) of Palaemon alphonsianus. (10) Ditto (right) ditto. (11) Palaemon onnensis, Hoffm. (12) Second Pair of Legs of Palaemon reunionnensis. (13) Palaemon manus, Hoffm. (14) Second Pair of Legs of Palaemon longimanus. (15) Goniosoma m, Hoffm. (16) The Forceps of Goniosoma dubium, viewed from above. (17) Ditto, d from below. (18) Ocypoda cordimana, Latr. (19) Front part of the body of Ocypoda mana, Latr. 2|1. (20) The Forceps of Ocypoda Ceratophthalma fab., viewed from above. The Forceps of Ocypoda Ceratophthalma (male), viewed from below. (22) Female imen, without trace of the elevated ridge. (23) Front part of Ocypoda Ceratophthalma. Grapsus strigosus, Latr. (25) Grapsus Pharaonis, Milne Edw. (26) Front. (27) Forceps of Grapsus Pharaonis, Milne Edw., viewed from above. (28) Ditto, viewed from . (29) Palinurus Ehrenbergi, Heller. (30) The Forceps of Matuta distinguenda, n. (male), viewed from above. (31) Ditto, viewed from below. (32) Abdomen. (33) tta distinguenda, Hoffm. (female). (34) Ditto (male individu). (35) Palaemon mada-riensis, Hoffm. (36) Palaemon parvus, Hoffm.

DIVISION LI.

7. **POLLEN, DR. FRANÇOIS P. L.,** Scheveningen. II. Fishes Madagascar and Réunion. (1) Chocrops dodicanthus, Blkr. (2) Rilapia oligacanthus, .; Glyphidion Rhyncholepis; Blkr. Paretroplus van Dami, Blkr. (3) Epinephelus ni, Blkr. (4) Chrammistes ocellatus, Blkr. (5) Chaetopterus pristipoma, Blkr. (6) us vergeri, Blkr.; Gobius Samberanoensis, Blkr.; Paraupeneus multifasciatus, Blkr. (7) ephelus Retouti, Blkr.; Rhombotides Polyzona, Blkr.; Alticus aspilus, Blkr.; Alticus chrus, Blkr.; Lutjanus quinquelineatus, Blkr. III. Fishes from Madagascar and Ré-n. (1) Gobius polyzona, Blkr.; Chaetopterus microlepis, Blkr. (2) Lutjanus octo-tus, Lutjanus bengalensis, Blkr. (3) Gobius melanopterus, Blkr. et Gobius macrorhyn-, Blkr. Gobius isognathus, Blkr. et Cirrhites punctatus, Cuvier. Poissons de Mada-ar. (4) Myripristis corbonicus, Cv. (5) Mugil cephalotus, val et Balistes calolepis, Blkr. Anthias Borbonier, Günth et Paratilapia Polleni, Blkr. (7) Caesio xanthurus, Blkr.

3. **WUYSTER, M.,** Maassluis. A bottle, containing two Smelts of large size, caught with the line in 1878.

DIVISION LV.

). **HOFFMANN, PROF. C. K.,** Leyden. Zür ontogenie der kenfische.

**WATERPROOF FISHING COATS,**

TO SHORTEN AT PLEASURE, AND WITH INNER CUFFS
TO PREVENT WATER RUNNING UP.

**ANDERSON, ABBOTT, & ANDERSON,**
37, Queen Victoria Street, London, E.C.

70. **DIRECTION OF THE FISHERIES ON THE RIVER SCHELDE,** Bergen op Zoom. (1) A Map of the Province of Zeeland on which are marked in colours the different Fishing Grounds for Oyster and Mussel Culture and Bow Net Fisheries. (2) Two Maps showing the Fishing Ground leased by the Government at different Times.

71. **POLLEN, DR. FRANÇOIS P. L.,** Scheveningen. I. Fisheries of Madagascar, &c. (1) Shark Fishing by Night (Réunion). (2) Symbou Fishing of Malgache Women. (3) Wear Fishing (Madagascar). (4) Seine Net Fishing (Madagascar) (5) Hand Line Fishing by Night (Madagascar). (6) The Basar at Hellville (Nossi-bé). (7) Turtle Fishing (Madagascar). (8) Fish Merchant at St. Denis (Réunion). (9) Coral and Shell Fishing (Madagascar). A Book entitled: "Poissons et Pêches de Madagascar et de ses Dépendances, par P. Bleeker et François P. L. Pollen, 4°. 32 planches coloriées et une carte."

72. **BLEEKER, Mrs.,** the Hague. Atlas ichthyologique des Indes Orientales Neêlandaises par le Dr. P. Bleeker.

73. **DEPARTMENT OF THE FINANCES,** the Hague. Papers and maps on salmon propagation and salmon fisheries by Dr. François P. L. Pollen.

74. **DEPARTMENT OF THE FINANCES, THE HAGUE.** Dr. François P. L. Pollen's Drawings on Salmon and Salmon Fisheries. (1) A Development of the male and female generative products of the Rhine Salmon (Salmo Salar). (2) A Development of Salmon eggs after fecundation. (3) A Young Salmon (Parr-stage), aged two months. (4) A Young Salmon (Salmo Salar jud) one year old. (5) A Young Salmon (Salmo Salar jud) (Smolt) at the period when it travels down to the sea for the first time. (6) Salmo Salar (black-tail stage, Dutch Schotje) returning to the river for the first time. (7) Ditto, older stage. (8) Ditto, dwarf form, further advanced stage. (9) Difference between Salmo Trutta and Salmo Salar. (10) A so-called St. Jacob's Salmon, at the period when it is for the first time fit for breeding. (11) A so-called St. Jacob's Salmon, older stage. (12) A so-called May Salmon (Salmo Salar), further advanced stage. (13) A so-called Gray Salmon, September to December. The male salmon in the spawning season. (14) A so-called Gray Salmon, September to December. The female salmon in the spawning season. (15) So-called Hunger (Stallion) Salmon. February to May. (16) Winter Salmon. October to February. (17) Salmon Trutta L. (18) So-called Schot or Hone Salmon (Salmo Trutta, var.) (19) So-called Schot or Hone Salmon (Salmo Trutta). (20) Trout (Salmo fario) Dutch Beekford. (21) Coregonus Oxyrhynetus, Dutch Pouting of Adelvisch. (22) Smelt (Salmo eperlanus) Dutch Spiering. (23) Young Shad (Alosa vulgaris), Dutch Eels. (24) Ripe Female Shad (Alosa vulgaris). (25) Shad after spawning, on its way back to the sea. (26) Grey Mullet (Mugil shelo) Dutch Harder. (27) Sturgeon (Acipenser Sturio) Dutch Stem. (28) Salmon Seine-Net Fishery, Klein Profijt. (29) Ground Plan of the Salmon Seine-Net Fishery, the Kykuit. (30) Ground Plan of the Salmon Seine-Net Fishery, the Goede Verwachting. (31) Salmon Seine-Net Fishery, Kykuit. (32) Ditto, Goede Verwachting. (33) Ditto, near Sliedrecht. (34) Ditto, near de Groote Lindt. (35) Ditto, near Ammerstol. (36) The interior of a Salmon Fisher's Hut. (37) Winter Drift-Net. (38) Sketch of the way in which Fishing with Salmon Seine-Nets is carried on. (39) Salmon Seine-Net Fishing on the German Rhine. (40) Salmon Fishing with Drift-Nets. (41) Salmon Fishing with Stake-Nets. (42) A Trench Salmon-Net with three pits. (43) Pocket-Nets of the Solway Firth. (44) Stake-Nets of the Solway Firth. (45) Bleak Fishing with Fence-Nets. (46) Stake Fishing. (47) Fishing with Pit-Nets. (48) Eel Fishing. (49) Fishing with Hand-Lines. (50) Eel Fishing with the Line. (51) Weel for Lampreys. (52) Salmon Traps. (53) Fish Culture. (54) Map of Germany. (55) Map of the so-called Zuid Hollandsche Waard, inundated in 1421.

DIVISION LVII.

75. **ROYAL ZOOLOGICAL SOCIETY — "NATURA ARTIS MAGISTRA,"** Amsterdam. Plans and Photographs of the Aquarium.

DIVISION LX.

76. **POLLEN, DR. FRANÇOIS P. L.,** Scheveningen. (1) Seven years of the General Fisheries Newspaper, under editorship of François P. L. Pollen, 1869-1875.

ALL THE LATEST IMPROVEMENTS IN

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WORKS—LIMEHOUSE, E.

with different Photographs of exhibits relating to the Fisheries, from the Exhibi-
in, 1873, entitled: Erinnerung an die Erste Austellung von Geräthsschaften und
der See-und Binnenfischerei in Berlin, 1873." (3) "Erinnerung an die Inter-
ischerei Ausstellung zu Berlin im Jahre 1880." (4) A Dutch paper entitled: "Is
t between the States on the River Rhine concerning the Common Regulations of
'isheries Advantageous for the Netherlands?" A question answered by François
, 1870, 8°, 32 pages. The German translation has been published in Circular
pag. 19–33, of the Deutsche Fischerei-Verein at Berlin.

**YAL COMMISSION OF SEA FISHERIES.** (1) The
ts concerning the Netherlands Fisheries, drawn up by the Royal Commission of
s since 1857. (2) Diagrams, Curves and Statistical Tables concerning the state
gress of the Netherlands Fisheries.

**EVENSTUK, A.,** Calligrapher, Amstersdam. Drawing repre-
fishes, the fish-markets in the principal towns and fishermen's costumes of the

**L DUTCH METEOROLOGICAL INSTITUTE,** Utrecht.
t is placed under 389, Great Britain, Division IX. (1) A Set of Papers concern-
Fisheries compiled from observations of fishermen by the Royal Dutch Met.
2) Instruments, &c., for Forecasts of the Weather and for Storm Warnings.
noscope (Model) $\frac{1}{30}$. This instrument has been erected in the seaports of the
on a place visible to ships in the Roads, for showing to captains the direction in
serving Stations with highest and lowest barometrical pressure respectively lie,
ount of difference between these two places at 8 a.m. This will enable them to
rognostics of the expected wind and weather themselves, by means of the Law
ie connection between barometer difference and wind, This law, generally called
Ballot" Law, because Professor Buys Ballot, the Superintendent of the Royal
orological Institute at Utrecht, found it after long researches, states: "The air
d the place with lowest barometer pressure from right to left on the Northern, and
ight on the Southern hemisphere." An observer placed in the line between the
ith highest and lowest barometer pressure, and looking towards the latter, will
d from the left hand in the Northern hemisphere, and from the right hand in the
This law was first communicated by Professor Buys Ballot to the meeting of the
my of Science at Amsterdam in October, 1857, and published in the annals of the
e of 1858, and in several foreign scientific papers. Since that date it was gene-
as can be shown from the U.S. Senate Papers, Fifth Congress, May 6th, 1858,
stions about Meteorological Researches in the Lake districts were discussed. Upon
based all the weather charts and storm warnings from the several Met. offices in
ime. The system still used in the British Isles of giving warning of probable
ong winds by hoisting cones or drums in the seaports, was abandoned in Holland
ago, because it seemed more practical to induce captains to make the prognostics
The Æroklinoscope itself consists of an iron pole, having a balance-shaped
t the top, which can be moved in the vertical plane by a long iron rod fixed at the
oss-beam. This iron pole is fixed to a wooden one, and can be turned round its
a handle at the lower end in order to put the cross-beam in the direction of the
ices with highest and lowest barometer pressure, while an inclination is given to
m, according to the amount of barometric difference between these two places.
d globe of iron frame-work hangs on the northern arm of the cross-beam to
t from the southern when at a distance from the instrument. (3) Wooden Case
Reports (Model $\frac{1}{4}$). This case is an appendage to the æroklinoscope. For those
might like to investigate the question, the readings of the barometer and ther-
ection and force of the wind, on the three last days at the principal places of
exhibited every day close to the instrument, thus giving a general view of the
f the atmosphere over Europe. (4) A set of instruments as provided to ships in
— One mercurial Barometer; one Aneroid Barometer; one Psychrometer (dry
b Thermometers); three Thermometers for Surface Temperature; one set of


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srs. Anderson, Abbott & Anderson, [COPY.] Horse Guards, 12th *June*, 1871.
he Valise made by your firm has been found well suited for the conditions proposed, viz., to
an officer to carry the articles absolutely required for service; and the waterproof sheet
rs as a bed; the whole, fittings included, not exceeding forty pounds weight. The pattern
en deposited at the Horse Guards for inspection.—Arthur Herbert, A.A.G., Col.

# NORWAY.

(*For Plan, see p.* 306.)

Living in a country whose soil was poor, and which was surrounded by the sea, the Norse immediately after their immigration from the south or the east, began to utilise this sea which abounded in fish of different species. But fishing did not satisfy them long; the rise of the southern countries drew their minds towards these happier regions; the woods, which covered their mountains and hills, offered them the principal materials for attaining the fulfilment of their desires; and at the same time when the history of Norway begins in the eighth century, the annals of Germany, England, and France, mention the Norse Vikings as plundering their coasts. In the following century we find them in Ireland, where they founded several states under their chiefs (sea-kings), and in the Mediterranean, and in 874 they discovered and peopled Iceland. From here they went to Greenland; and in the year 1000 Leif Eiriksson and his followers established themselves in Massachusetts, which they called *Vinland*. But the Norse colonists could not resist the great number of natives, and being moreover at variance they soon returned to Iceland, from whence they seem to have kept up communication with the new world for the next forty or fifty years. In the middle ages the mighty Hansa-confederacy ruined the Norwegian shipping-trade, but rather benefited the fisheries by improving the commerce of fish produce exported all over Europe. In the seventeenth century and later, the shipping as well as the fisheries, successively, had developed considerably; and at present, according to the last census, from 70,000 to 80,000 persons, or 4½ per cent. of the whole population, are employed in the fisheries, and about 50,000 persons, or 2⅞ per cent., in the shipping trade. In many districts, the building of boats for the fisheries is of some importance. In the boats there is a great variety of forms, according to the waters they have to cross and the different kinds of fishery for which they are intended. The visitors to the Exhibition will find a large collection of models of boats in the Norwegian department. As early as the ninth century, the history of Norway mentions the importance of the Vestfjord cod fisheries, describing the Lofoten islands as the principal station. There has never been any record of the non-appearance of codfish at this part of the coast in the season, the quantities varying from miles of shoals to lesser quantities. The herring fisheries were at one time of almost as much importance for the Norwegian commerce as the cod fisheries. At present the winter or spring herring fishery is of little importance, amounting to scarcely 30,000 barrels a year, while the summer or fat-herring fishery produces an average of 600,000 barrels of pickled herrings annually. The salmon, trout, lobster, mackerel, and eel fisheries are of minor importance, the aggregate value being but 1,700,000 kroner, or £[illegible] yearly, while the cod and herring fisheries yield the fishermen 21,500,000 kr., or £1,[illegible] a year.

## THE GREAT COD FISHERIES.

The Lofoten Cod Fishery.—Lofoten is the name of a group of islands extending west from the main land from 68° 36′ to 67° 25′ and forming with it the great Vestfjord. The permanent population of these islands is scarcely more than 25,000, supported chiefly by fishing. We find however, on some of the larger islands, very good and well kept meadows. Besides the dwellings of the permanent population, there are in every bay, which is in a degree protected from the ocean, a number of huts which the proprietors, who are frequently merchants and fishermen, have built, and let out to fishermen from other places during the season. These huts, which usually are arranged for one or two boats' crews, six to [illegible] persons, consist of only one room with deal berths along the wall, and another room for keeping the nets, cords and lines, barrels for the roe and oil, and the provisions and clothes of the fishermen. The codfish are taken in Lofoten in three ways, namely, with hand-lines, with long-lines, and with gill-nets. It is generally the poorest fishermen who use hand-lines *only*. Their catch amounts on the average to 50 fish daily for each man; sometimes however they get from 100 to 120. For bait they use fresh or salt herrings; and when these are

not to be had, pieces of codfish or its roe. A boat equipped for long-line fishing is 36 to 40 ft. long, 9 to 10 ft. wide, and 3 ft. deep, has at least six sets or 24 lines, each 120 hooks, 6 or 8 ft. distant, on fine snoods of hemp or cotton, 16 to 20 in. long. The is the same as in hand-line fishing. At the time prescribed by the officers in charge o Fishing Stations, usually in the afternoon, and only at the places they appoint, the lines ar with from 500 to 2400 hooks, according to the number of the crew and to local circumsta If the fish rise from the bottom, the lines also are raised to the same height by mea glass floats. On the following morning the lines are taken up. If the fish are near the and not much time is required for rowing out and back, the fishery with long-lines may place during the day. The proceeds of this fishery are of course very variable. On the ave it may be taken from 50 to 60 fish daily per set (Bak). The boats equipped for fishing gill-nets have generally 30 to 35 nets on board. The length of the nets varies from 15 fathoms; the depth between 25 and 60 meshes, measuring from 80 to 95, and somet 35 to 100 millimetres between the knots on each side. The nets are kept upright in water by floats of hollow glass (an invention by Mr. Christopher Faye in Bergen), or cork. A catch of between 400 and 500 cod is considered satisfactory. If the take ex 300 to 800 fish, the fishermen are obliged to leave part of the nets in the sea until the season, as the boats can seldom hold a larger number of fish besides the nets and the The catch of codfish for the years 1876–82, for Lofoten, in the season, *i.e.* from January to or May, was an average, 26·3 millions fish. The number of fishermen, 26,309, with from to 6800 open boats.

The Other Large Cod Fisheries.—While great shoals of cod come into the Vestfjord, ot in order to spawn, seek the banks on the outside of the coast from the 69th degree of lati to the North Cape. Small shoals of cod with roe and milt appear up to Vardö. But th generally of small importance in comparison with that of the so-called capelin fishery. the end of February—sometimes earlier—the appearance of millions of gulls (Larus gla Larus eburneus) and the blowing of a number of whales on the surface of the ocea the vicinity of the North cape, or frequently somewhat more to the east, announces tha small capelin (Mallotus villosus, Osmerus arcticus) the favourite food of the codfis approaching the coast; and the codfish follow in immense masses. Towards the end of the capelin usually retire to the ocean, accompanied by the masses of cod, which fishermen pursue to a distance of some miles from the coast. But in the Varanger they sometimes remain until June. The average catch for the years 1876 to 1880 is ca lated at 15·3 millions of cod, for on the coast of Finmarken, the number of fishermen b over 14,000 and of the open boats over 4000. From January or February to April or the cod fishery is also going on from open boats, and partly from decked vessels, along coast of Romsdal, Söndmöre, and Nordmöre (between Cape Stat and Trondhjem). The c of the season was on an average, for the years 1876–80, about 7·5 millions of cod, maki total for all the three cod fisheries mentioned above an average of 49·1 millions of co the *winter* and *spring* seasons. The catch of cod, ling, tusk, coalfish, and haddock, in *summer* and *autumn* is of less importance, and so is the catch of cod in winter and sprin other stations than the above-mentioned parts of the coast. If all these fisheries are together, the amount of fish caught will be pretty large, as it yields an average *expo* dried and dry-salted fish of 75,000,000 yearly, which would answer to about 375,000 to live fish.

## THE HERRING FISHERIES.

The annals of Norway mention that in the first half of the sixteenth century the fishe *winter* herrings took place on a large scale in the neighbourhood of Bergen, while towards the fish did not visit these coasts. It is supposed that the herrings were again there in seventeenth century; but it is known that from 1650 to 1654 there was no fishery. In probability the fishery did not recommence before 1699 or 1700, and from this time it carried on uninterruptedly until 1784, although with extremely variable results. In year 1784 the herrings again deserted the coast, and did not reappear until 1808. F this year to 1870, the winter herrings have constantly visited the coast in great mas yet a remarkable decrease was noted in the last named year. At present there are scar more than 30,000 barrels of spring herrings caught at the old stations. The shoals of herr

which selected the coasts south of Bergen for their spawning place, usually moved from south to north, from Skudesnæs fjord to Selbo fjord, both along the outside of the islands and among them. The shoals which had their spawning ground to the north of Bergen moved on the contrary from north and south from Bremanger to Fensfjord; others [illegible] somewhat later on the environs of Cape Stat and the Söndmöre coasts. The herring was caught by gill-nets and sweep-nets, or large seines, a gill-net boat being furnished with from 20 to 40 or 60 nets of about 12 to 15 fathoms long and 100 to 120 meshes deep, the size of the meshes being 28 to 35 millimetres between the knots. With the large seines [illegible] 3 boats, and 20 to 25 men employed, the seines being 100 to 150 fathoms long, and [illegible] to 30 fathoms deep, or less, that is from 80 to 100 fathoms long, and 15 to 20 fathoms deep. Gear and boat would cost £400 or £500. The number of fishermen employed in the fishery was about 25,000 to 30,000 with 6000 open boats, and, if the crews of transport vessels, working people, and coopers are counted, there would be at least 50,000 persons. The total catch for the season averaged 600,000 to 800,000 barrels. But in the last years the summer herring fisheries have become the most important, almost taking the place of the winter fishing. In July the *summer*-herrings are usually found somewhat more towards the north, in Søndfjord, Nordfjord, Romsdal, and afterwards in Nordmøre in the Trondhjem fjord, in the Namsen fjord, also along the coast of the province of Nordland, and even up to Finmarken. The shoals of summer-herrings are very irregular; but no year is known in which some tracts of the coast mentioned has not been visited by larger or smaller shoals of them. The herrings caught in August and September are preferred; not only is the fish then still very fat, but the lining fat is also firm and will keep well. Later in the autumn the lining fat decreases and is replaced by milt and roe. At the end of November the fishery usually ceases; but in several of the deeper fjords, such as the Trondhjem fjord, Namsen fjord, and Eidsfjord in Vesteraalen, the herrings often remain till January. But at this period the herrings are very thin and dry, and are chiefly used as bait for cod-fishing. The gill-nets used for this fishery are usually from 15 to 50 fathoms long, 200 to 250 meshes deep, and the meshes 23 to 27 millimetres between the knots. Large seines or sweep-nets are also used to a considerable amount. There are no exact statistics of the catch; it has given annually an export of from 500,000 to 600,000 barrels of pickled herrings as an average for the years 1877–80, and has employed 35,000 or 40,000 fishermen.

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Of other fisheries on the coast, of some importance to the population, there are the sprat, the mackerel, the salmon, and the lobster fisheries; these will, however, altogether not exceed 7 per cent. of the value of the Norwegian *coast-fisheries*, just mentioned. The fisheries for supplying the local fresh-fish markets of Norway are not yet subject to any statistical record.

The *deep-sea* fishery in the North Sea is still a trifling one as far as Norway is concerned, but the whale-fishery by steamers on the coast of Finmarken has become rather large of late years, employing in 1883 over 20 steamers, and yielding last year a catch of 386 whales.

Combined *fishing and hunting* expeditions are carried on by about 80 decked vessels in the Arctic Sea and on the coast of Spitzbergen; the result last year was half a million of seals, 6000 seals, 148 walruses, 49 polar bears, 260 reindeer, etc., amounting in value to £140,000. The *sealing* or seal-hunting by steamers in the Arctic Sea is another trade that last year was carried on by 15 steamers of an average of 259 tons, and gave a result of 100,000 seals and 19,000 barrels of fat and oil.

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Further particulars respecting the fish trade and commerce of the country will be found under the head of Class III. as statistical notes on the export of fish products from Norway.

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## Division I.

**1. AALESUNDS SLYNGEFABRIK,** Aalesund (Owners: P. Stafseth and Kraasby Brothers), Manufacturers of Handlines and Snoods of Hemp, Cotton, Linen, and Silk. Export. *Awarded*—Philadelphia, 1876, Medal; London, 1877, Medal; Paris, 1878, Medal; Berlin, 1880, Silver Medal; Edinburgh, 1882, Silver Medal. (1) Handlines and Snoods. (2) Braided, Tapered, and Twined Snoods. (3) Samples of Goods.

2. **DAHL, IENS O.,** Hanø. (1) Different Cod Gill Nets, as used at the oten cod fisheries. (2) Long lines for the same fisheries, 8 different kinds. (3) Hand-s, Iigs and Drails, for Codfish, Coalfish, Haddock, &c.

3. **FAGERHEIMS MEK. NOT- & GARNFABRIK,** Bergen. ufacturers of Seines and Nets, in complete order; established 1873. Exporters to den, Denmark, Russia, &c. *Awarded*—Viborg, 1875, Bronze Medal; Paris, 1875, Silver al; Norrkoping, 1876, Great Silver Medal; Philadelphia, 1876, Medals for Nets and es, very well constructed, double knotted, and of good material; Paris, 1878, Bronze al; Berlin, 1880, Gold Medal. (1) A complete Herring Seine of Hemp Twine, tanned rch bark, with 2 four-armed anchors, 2 keg floats, 2 "skimblers," herring glass, herring ine, &c. Length, 56·5 meters; depth, 9·5 m. (2) Herring Gill Nets of Linen for the mer Herring Fishing, white tanned or galvanized, complete: 15·7 m. long, 7 meters deep. Ditto, of Linen, for the Summer Herring Fishing, complete; 17 meters long, 7 meters : not tanned. (4) Ditto, of Linen, for the Summer Herring Fishing, tanned in catechouc, plete; 15·7 meters long, 7 meters deep. (5) Ditto, of Cotton, tanned in catechouc, com-; 15·7 meters long, 6·3 meters deep. (6) Ditto, of Cotton, complete; 16·3 meters long, ters deep. (7) Ditto, of Cotton, not tanned; complete; 16·6 meters long, 7 meters deep. Ditto, of Hemp, tanned in birch bark; complete; 16·3 meters long, 7 meters deep. (9) , of Hemp, not tanned; complete; 17 meters long, 7 meters deep. (10) Ditto, of Hemp, he Winter Herring Fishing, tanned in birch bark; complete; 38 meters long, 200 es deep. (11) Ditto, for the Winter Herring Fishing, not tanned; complete; 18 meters 100 meshes deep. (12) Mackerel Net of Cotton, No. 45/9, tanned in birch bark; com-; 38 meters long, 100 meshes deep. (13) Tramail Net in French Style, tanned in birch ; complete; 17 meters long, 2 meters deep. (14) Ditto, not tanned; complete; 17 rs long, 2 meters deep. (15) Cod Gill Net of Hemp, with Glass Floats, not tanned; plete; 30 meters long, 40 meshes deep. (16) Herring Drift Net of Cotton, No. 45/9, in tish Style, tanned in catechouc; complete; 28.25 meters long, 300 meshes deep.

4. **FALCK-YTTER,** Kristiania. Ice Fishing Sledge, with Implements Propelling with Sticks; Drawings of Snow Shoes for Crossing the Ice as well as ntains.

5. **FEDDERSEN & NISSEN,** Hammerfest. *Awarded*—Wien, 1873, erkennungs Diplom; Berlin, 1880, Silver Medal. (1) Implements for Shark, Dolphin, rus, and Seal-Fishing:—Windlass and Lines (200 fathoms), with Iron Sinker, Hook and d of Chain, for Catching the Arctic Shark (*Scymnus borealis*). Dolphin Harpoon, with a of Handle and Line (for *Dolphinapterus leucas*). Walrus Harpoons and Lances, with a of Handle and Line, different forms. Ice Anchor for the Boat. Knife and Hook with dle. Arctic Shark (*Scymnus borealis*) Harpoon, with moveable Wings, Lance, Hooks, and of Bellows to make the killed shark float. Gaff, Bait Knife, Lever Knife, and Club. Model of Boat, used in the Arctic Sea for above-mentioned fisheries, with Models of all lements.

6. **FINEIDE, L. JOHANNESEN,** Hemnaes, Fisher at the Lofoten and marken Fisheries. Cod Gill Net, with newly invented Glass Floats and with pieces of n for Sinkers. Exhibitor's invention.

7. **IRGENS, IØRGEN,** Bergen, Inventor of Patent Hooks. *Awarded*—in, 1880, Silver Medal. Hooks and Iigs, with artificial Glass Bait.

8. **KRISTIANIA SEILDUGSFABRIK,** Kristiania, Manufactory of ne, Nets, and Seines. *Awarded*—London, 1862, Medal; Stockholm, 1866, Silver Medal; logne-sur-Mer, 1866, Silver Medal; Paris, 1867, Silver Medal; Copenhagen, 1872, Silver al; Vienna, 1873, Verdienst-Medaille; Philadelphia, 1876, Medal; Paris, 1878, Silver al; Berlin, 1880, Silver Medal. Seines and Nets.

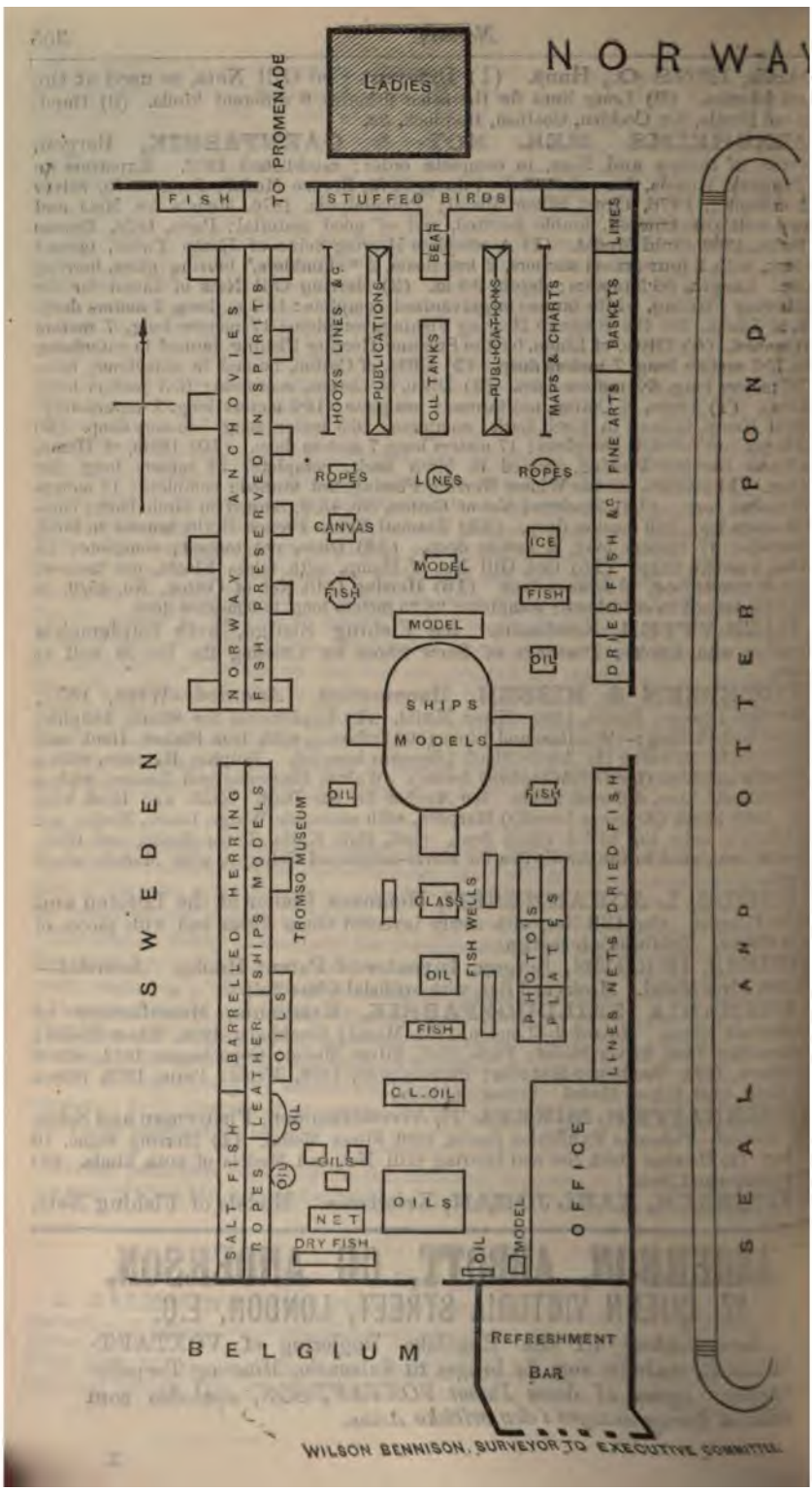
9. **LYSEKNAPPEN, MIKKEL T.,** Alverstrømmen, Fisherman and Seine er. *Awarded*—Fisheries Exhibition Berlin, 1880, Silver Medal. (1) Herring Seine, 10 rs long. (2) Herring Drift Net and Herring Gill Net, and Models of both kinds. (3) ples of Seines and Nets.

10. **PETERSEN, KARL JOHAN,** Kristiania. Models of Fishing Nets.


# ANDERSON, ABBOTT, OG ANDERSON,

## 37, QUEEN VICTORIA STREET, LONDON, E.C.

Leverandører til den Engelske Regjering af VOXTAFT-KLÆDER, saaledes som de bruges til Submarin, Mine- og Torpedo-Arbeider; ogsaa af deres Patent VOXTAFT-SOK, saaledes som indfört af dem og antaget i den britiske Arme.


NORWAY
LADIES
TO PROMENADE
FISH
STUFFED BIRDS
BEAR
LINES
BASKETS
FINE ARTS
DRIED FISH &c
HOOKS LINES &c
PUBLICATIONS
OIL TANKS
PUBLICATIONS
MAPS & CHARTS
NORWAY ANCHOVIES
FISH PRESERVED IN SPIRITS
ROPES
LINES
ROPES
CANVAS
ICE
MODEL
FISH
FISH
MODEL
OIL
SHIPS MODELS
SWEDEN
OIL
FISH
DRIED FISH
BARRELLED HERRING
SHIPS MODELS
TROMSO MUSEUM
CLASS
FISH WELLS
PHOTOS
PLATES
OIL
LINES NETS
OILS
FISH
LEATHER
C.L. OIL
OIL
SALT FISH
OILS
OIL
ROPES
OILS
NET
DRY FISH
OFFICE
MODEL
OIL
SEAL AND OTTER POND
BELGIUM
REFRESHMENT BAR
WILSON BENNISON, SURVEYOR TO EXECUTIVE COMMITTEE

**ı. SCHJØTT, H. E.**, Bergen, Manufacturer and Ropemaker, Exporter. *rded*—Paris, 1878, Bronze Medal; Berlin, 1880, Silver Medal; Edinburgh, 1882, Silver al. (1) Herring Seine of Hemp, 120 fathoms long, 72 feet deep. (2) Model of Herring e Seine, improved, patented.

**2. SELSKABET FOR DE NORSKE FISKERIERS FREMME,** ;en (Norwegian Fisheries Improvement Association). A. Longlines with snoods and ;s, used in the Halibut fisheries. (1) Finmarken Halibut line with double twined and ed snoods, and Norwegian bent hooks No. 3/0; the snoods are easily untied whenever ired. (2) Nordland or Lofoten Halibut line, with double twined and tanned snoods, and wegian bent hooks No. 2/0; the snoods are easy to untie whenever required. (3) Nordland or ten Halibut line, with ordinary snoods and the hooks No. 1/0; the snoods are easy to untie never required. (4) Sóndmóre Halibut line with braided cotton snoods and hooks No. 1/0. Sartoren Halibut line, with snoods and hooks No. 3; line and snoods tanned; as used re the year 1870. (6) Sartoren Halibut line, tanned, with snoods and hooks No. 4; as l now. B. Long-lines with snoods and hooks, used in the Cod fisheries. (7) Finmarken -line with snoods and hooks, No. 7 Kirby bent, mounted in the new style; snoods with nary hooks and with Kirby bent hooks, mounted in the old style; with end-buoy and dle-buoy constructed of glass-floats, and anchor-stones. (8) Lofoten Cod Night-line, with ds and Norwegian hooks No. 8, as used before the year 1850. Model of the hook-holder. Lofoten Cod Day-line, with snoods and Norwegian hooks No. 7, as used before the year ). Model of the hook-holder. (10) Lofoten Cod Night-line, with snoods and hooks No. 8, y bent, as used in the years 1850-1860. Model of the hook-holder. (11) Lofoten Cod -line, with snoods and hooks, No. 7 Kirby bent, as used in the years 1850-1860. Model of hook-holder. (12) Lofoten Cod Night-line, with snoods and English hooks No. 7, as now . Model of the hook-holder. (13) Lofoten Cod Day-line, with snoods and English hooks, S, as now used. Model of the tub for the line. (14) Lofoten Cod-line as used for Finmar- fishgrounds; also used as Ling and Halibut line in deep sea fisheries, with ds and Norwegian bent hooks No. 4, as used before the year 1880. Model of the hook- er. (15) Lofoten Cod-line for Finmarken fishing grounds, also used as Ling and but line in deep sea fisheries, with snoods and plain hooks No. 5, as used now. Model of hook-holder. (16) Fosen Cod-line with ordinary snood sand hooks No. 7. (17) Sóndmóre -line, with cotton snoods and hooks No. 7, used in the shore and bank fishery. (18) Sónd- Cod-line, with cotton snoods and hooks No. 7, used in the deep sea fishery. (19) Lister -line, with snoods and hooks No. 9, used in the shore fishery. (20) Lister Cod-line, with ds and hooks No. 6, used in the deep sea fishery. Line holder of hoop-nets. C. Long Lines, snoods and hooks, used in different fisheries. (21) Lofoten Haddock and Plaice Long , with snoods and Norwegian bent hooks No. 11, as used before the year 1850. Model of -holder. Lofoten Haddock and Plaice Long Line, tanned, with snoods untanned, and s No. 10, as used now. Models of hook-holder. (22) Sóndmóre Haddock Long Line, snoods and hooks No. 9. (23) Sóndmóre Plaice Long Line braided, with braided snoods hooks No. 10. D. Handlines and gear used in Shore and Deep Sea Fisheries. (24) marken handline with gear, rope horse, iron sinker (3¼ pounds), snoods, hooks No. 3, used he Finmarken Shore and Deep Sea Fisheries (hooks and snoods are untied when required.) ) Finmarken Coalfish Gear, with lead and spoon bait, linen snood mounted to brass wire, k and spoon bait No. 4. (25*a*) Also loose snood and spoon bait used when the fish goes er in the water. (26) Lofoten Handline with gear, iron spreader and iron sinker (2½ nds), brass swivels, braided cotton snoods, English hooks No. 8. (26*a*) Also loose snoods raided linen, and Norwegian bent hooks No. 4, used in the Tusk Fishery, also in the wegian Haddock (Sebastes Norwegicus) in 200 fathoms deep water. (27) Lofoten Hand- with gear, rope spreader and iron sinker (3¼ pounds), braided linen snoods, hooks No. 3, d at Lofoten, Finmarken, &c., with different sizes of hooks according to the fish. Model of k-holder. (28) Sóndmóre Handline with gear, lead and braided snood, mounted with tin s, hooks No. 3, used in the different Bank Fishing, Coal Fish, Cod Fishing, &c. (29) toren Handline with gear, tanned line, iron sinker, four-twined snood, hook No. 8, bait hid a crab-shell, old style, used in the Cook Wrasse Fishery. (32) Lister Fishing Gear, with ss horse and swivel, lead and snood, special kind of hook mounted with brass wire (to pro- t it against the teeth of the fish). Used in the Shore, Deep Sea, Coal Fish and Cod Fishery.


# ANDERSON, ABBOTT, OG ANDERSON,

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Störsto Fabrikanter i Verden af de

BEDSTE VOXTAFT · KLÆDER.

*Priis-Medailler paa alle Internationale Udstillinger.*


x 2

(33) Lister Fishing Gear, with double brass horse and swivel, lead and snood, hooks No. 4, mounted with brass wire. Used in the Shore and Deep Sea Coal Fish and Cod Fishery. II. Implements connected with Line Fishing. (34) Halibut Gaff from Finmarken. (35) Ditto from Sartoren. (36) Codfish Gaff from Finmarken. (37) Long-line Roller from Finmarken. (38) Hand-line Roller from Sartoren used in shore fisheries. (39) Ditto, used in deep-sea fisheries. (40) Bait Needle from Finmarken, used in the halibut fishery. (The bait is put on the hook by running the needle and snood through the bait, until the hook is reached.) E. Nets and Seines. (41) Sóndmóre Cod-Gill Net, with wooden floats. (42) Sóndmóre Cod-Gill Net, with glass floats and wooden floats. (43) Model of improved Purse Seine, intended for herring fishing.

13. **TIBERG, JCH. P.,** Kristiania. Jigs for saltwater fishing.

14. **TIMMS REBERBANE,** Kristiania, Ropemakers, Exporters. Whaling and other Lines.

15. **WALLEM, FREDRIK, M.,** Bergen. (1 and 2) Herring Handline with hooks used without bait on the South Coast of Norway. (3) Herring handline adapted from Germany. (4) Herring-lead used to sound the shoals when seining the herring. (5) Plaice-lead used in the shore fishery. (6) Halibut-lead used in the shore fishery. (7) Wolf-fish-lead with hooks.

DIVISION II.

16. **LYSEKNAPPEN, MIKKEL T.,** Fisherman and Seine-maker, Alverstrommen. (1) Eel Pot. (2) Crab Pot.

17. **SELSKABET FOR DE NORSKE FISKERIERS FREMME,** Bergen (Norwegian Fisheries Improvement Association). Collection of Nets and Pots.

DIVISION III.

19. **LASSEN, TELLEF,** Shipbuilder, Arendal, Shipyard at Colbjörnsvig. Model of a Steam Trawler, and Drawings for constructing ship and rigging.

20. **VULCANS VÆRKSTED,** Kristiania, Foundry and Ship Yard; *Awarded*—Kristiania, 1877, Diploma; Copenhagen, 1872, Medal; Drammen, 1873, Medal. Open Steam Launch of oak, with steel gun, harpoons, &c., for shooting Whales. 8·16 meters long, 2·12 meters broad, and drawing 0·94 m. of water. These boats are attached to whalers and seal-ships, and also used as tenders.

DIVISION IV.

21. **ALLERS, CARSTEN,** Bergen. Boat from Oselven (near Bergen) with rigging and outfit. This type of boat is common on the western coast of Norway for shore fishing, and is well known for being handy; also for sport.

22. **ARCHER, COLIN,** Laurvik, Boatbuilder, Smack-builder, and Constructor of Ships. *Awarded*—Berlin, 1880; Ehrenvolle Anerkennung; London, 1862, Silver Medal. Model of a Fishing-Boat.

23. **BERG, NILS,** Aarnaes, Aafjorden, Boatbuilder. Boat from Aafjord. This type of boat is well known for speed as a rowing boat.

24. **CHRISTENSEN, A.,** Husby, Helgeland. *Awarded*—Bergen, 1863, Mention Honorable; Tromsö, 1870, Diploma. Model of Cod Gill-net Fishing Boat, as used at the Lofoten Fisheries.

25. **DAHL, A. C.,** Ringholmen, Manager of the Ringholmen Lighthouse. *Awarded*—Berlin, 1880, Silver Medal. (1) Three Models of Boat with Rigging and Sails. (2) Model of a Sail-thwart for small boats, to avoid upsetting of the boat when sailing and struck by a gale. (Exhibitor's invention.)

26. **FINEIDE, L. JOHANNESEN,** Hemnæs. Model of improved Fishing-Boat for the Lofoten and Finmarken Cod Fisheries. (Exhibitor's invention.)

**ANDERSON, ABBOTT, AND ANDERSON.**

**37, Queen Victoria Street, Londres, Angleterre,**

UNIQUES FABRICANTS et FOURNISSEURS de la Police Métropolitaine de Londres de leurs *Collets imperméables*, dont se servent tous les principaux Sergents de ville anglais, irlandais et écossais.

7. **FÜRST, A. D.**, Arendal, Boatbuilder and Exporter of Boats to len, Denmark, Hamburg, and England. *Awarded*—Copenhagen, 1872, Diploma; ıamen, 1873, Diploma. Model of Shore Fishing-Boat with Outfit.

8. **HANDELSFORENINGEN**, Trondhjem, The Commercial Asso- on at Trondhjem. Models of (1) the Nordland Fishing-Boat. (2) Herring Drift-net , with Nets and Outfit. (3) The Aafjord Boat for Cod Fishing. (4) River Boat. (5) llands Jægt, used as transport vessel.

9. **IENSEN, OLUF**, Bergen. Models of Boats.

0. **KALLEVIG, HARALD**, Arendal. Model of Fishing Vessel, with Rigging and Sails.

1. **LASSEN, TELLEF**, Arendal, Shipbuilding-yard at Colbjörnsvig. lel of Well-Smack for Cod Fishing, and Drawing for Constructing the Vessel and Rigging.

2. **LYSENKAPPEN, MIKKEL, T.**, Alverströmmen, Fisherman and ıe Maker. Models (1) of a Herring Seine-Boat, with Seine and Outfit; (2) of a Herring t-net Boat.

3. **MEYER, L. A.**, Mo, Ranen, Boatbuilder and Exporter. *Awarded*— nsö, 1870, Diploma. Small Nordland Boat, of the Ranen type, for four oars, 5 meters long, meter broad.

4. **NYGRUND, S.**, Stavanger. Collection of Models of 13 different vegian Fishing Vessels and Boats: Models of (1) Vessel, from Ryfylke (40 Tons). (2) ced Boat, from Hardanger (25 Tons). (3) Mackerel Boat, from Lister. (4) Pilot , from Hvalöerne. (5) Fishing-Boat, from Listęr. (6) Fishing-Boat, from Ryfylke. Seine Boat, with Seine. (8) Six-Oar Boat, from Ryfylke. (9) Six-Oar Boat, from langer. (10) Four-Oar Fishing-Boat with Floating Fish-well, from Tysnes. (11) Four- Fishing-Boat with Well, from Ryfylke. (12) Large Nordland Boat. (13) Four-Oar ing-Boat with Well, from Hardanger.

5. **SELSKABET FOR DE NORSKE FISKERIERS FREMME,** ren (Norwegian Fisheries Improvement Association). Collection of Norwegian Fisheries els, representing all types of Norwegian Fishing-Boats and some Fishing-Vessels. (1) els of an Arctic Sea fishing-boat, with harpoons, lances, lines, axes, knives, &c., and also ing apparatus, &c., for the crew, used in the walrus-fishery and other Arctic Sea fishery, enth of full size. (2) A Fishing-Boat of the Ranen type, used in the Finmarken shore bank-fisheries, constructed of Mr. T. Jörgensen at Bodö, one-tenth of full size. (3) A ten fishing-boat, used in the Lofoten Cod-fishery with long line. Average full size, 12 es long and 2·7 metres broad. (4) A Lofoten fishing-boat, used in the Lofoten Cod- ry, with gilt nets. Average full size, 12·5 metres long, 2·9 metres broad. (5) A Lofoten ng-boat of the Helgeland type. Average full size, 12 metres long and 2·7 metres broad. A Nordland fishing-boat of the Aafjorden type, used in Lofoten fishery, one-tenth of the size. (7) A Nordland transport vessel (Jægt), used in the trade with dried fish, shipped ıe city of Bergen, about 350 miles off. The type itselt is many hundred years old, but been altered by degrees; this improvement is from last century. Average size, 22 metres 8·2 metres broad, 3·5 metres deep, tonnage, 80 tons. The square sail has two mourning es in the upper corners in regard of the death of the poet and minister Peder Dass, much emed and beloved of the population of Nordland. He died more than 100 years ago. (8) Nordland transport vessel (Jægt), used in the trade with dried fish, shipped to Bergen. er style. (See explanation of No. 7.) (9) A Lofoten lodging-vessel, used of the boat- s at the Norland fisheries, one-twentieth of full size. (10–11) A "Söndmöre" Cod gill- fishing-boat, used in the bank-fishery. Average full size, 12·5 metres long, 1·6 metres d. The special form of the square sail makes it easy for the boat to keep only 2½ points the wind. (12) A bank fishing-vessel, used at deep-sea cod and ling-fisheries off "Sönd- e" coast, one-twentieth of full size. (13) A fishing-boat from Nordfjord, used in the shore ery. Average full size, 9 metres long and 2·4 metres broad. (14) A Herring gill-net ng-boat from Söndfjord, used in the shore-fishery. Average full size, 9·4 metres long, 1·1


# ANDERSON, ABBOTT, OG ANDERSON,

**37, Queen Victoria Street, London, England.**

FABRIKANTER AF DE BEDSTE,

**VOXTAFT-KLÆDER** til Brug tilsös og tillands

ogsaa Voxtaft Hestedækkener, Dæksel til Vogne og Höstakke og deres bekjendte Patent vandtætte Klæde til Dækning Kjörrel og Vognforlæder.

*Copi af en Anbefaling.*

HERRER ANDERSON & CO., INDENRIGS MINISTERIET, *3de September* 1878.

De lavede for mig for omtrent syv Aars siden en Voxtaft Frakke, som i udmærket Stand har varet til i aar. (*undertegnet*) A. F. O. LADDELA.

metres broad. (15) A transport boat from Sulen at Sognefjord. Average full size, 10 metres long and 1·3 metres broad. (16) Ordinary fishing-boat from Sulen at Sognefjord. Average full size, 8·7 metres long, 1·3 metres broad. (17) Herring seine fishing-boat from Osterö. Average full size, 9·2 metres long and 1·2 metres broad. (18) Herring gill-net fishing-boat from Osterö. Average full-size, 8·8 metres and 1·3 metres broad. (19) Six-oar boat from Hatö by Bergen. Average full size, 7 metres long and 1·5 metres broad. (20) Four-oar boat from Strandebarm. Average full size, 6·5 metres long and 1·5 metres broad. (21) Six-oar boat from Strandebarm. Average full size, 6·3 metres long and 1·7 metres broad. The ordinary transport boat on the west coast of Norway. (22) The West coast Jægt or the ordinary cured fish-carrier from the large fisheries. Average full size, 57 feet keel, 66 feet long over all on deck, 18 feet broad, tonnage, 44 to 55 tons. (23) Herring Seine boat from Hardanger. Average full size, 8·7 metres long and 3·1 metres broad. (24) Herring gill-net boat from Hardanger. Average full size, 7·8 metres long, 2·7 metres broad. (25) Herring gill net boat from Lister. Average full size, 10 metres long, 3·1 metres broad. This type is considered to be the very best suited for the purpose. (26–30) Four and Six-oar boats from the West and South coasts of Norway. (31) The Hvalöer Fishing and Pilot-boat.

36. **ØWRE AND STENE.** Trondhjem. Model of a Nordlands Jægt and Picture of Lofoten Fishing-boats.

### Division V.

37. **NYDALENS COMPAGNIE,** Kristiania, Manufactory. *Awarded*—Berge, 1865; Stockholm, 1866; Boulogne-sur-Mer, 1866; Paris, 1867; Tromsö, 1870; Gothenburg, 1871; Copenhagen, 1872, medal; Wien, 1873; Fortschrittsmedaille, Lyskil, 1874; and Philadelphia, 1876, Medal; Paris, 1878, Gold Medal; Berlin, 1880, Medal. Cotton Canvas.

38. **STAVANGER REBERBANE,** Stavanger, Ropery. *Awarded*—Stockholm, 1866, Silver Medal; Drammen, 1873, Mention Honorable; Stavanger, 1880, Silver Medal. Collection of Ropes and Lines.

39. **TIMMS REBERBANE,** Kristiania, Ropemakers, Exporters. Samples of Ropes.

### Division VI.

40. **GODAGER, HANS,** Trondhjem, Manufacturer. *Awarded*—Paris, 1881, Medal. (1) Compasses for Vessels and Boats. (2) Requisites for Compasses.

41. **HANSEN, O. C.,** Skudesnæshavn, Manufacturer of Fog Horns. *Awarded*—Edinburgh, 1882, Diploma. Fog Horn, with handle to work the Bellows. The Fog Horn is in use in the Norwegian Navy, and by the Danish Surveyor of Lighthouses.

42. **JOHANNESEN, J. CAPT.,** p. t. **HOBOKEN,** New York, U.S. *Awarded*—Berlin, 1880, Silver Medal. Model of a patented Floating Anchor, for vessels adrift. Exhibitor's invention.

43. **LUND, P. B.,** Reisen. Sample of Tar.

### Division VIII.

44. **CHRISTIANSEN & CO.,** Laurvik, Proprietors of Laurviks Glass Work. Samples of Glass Floats for Fishing-Nets and Lines.

45. **FAGERHEIMS MEK. NOT OG GARNFABRIK,** Bergen. Manufacturers of Seines and Nets in complete order. Established 1873. Exports to Sweden, Denmark, Russia, &c. Samples of (1) Herring Seine of Cotton. (2) Herring Seine of Hemp Twine. (3) Sprat Seine of Hemp Twine.

46. **JACOBSEN, HANS,** Aalesund, Manufacturer. Machine-made Snoods and Lines.

47. **KRISTIANIA SEILDUGSFABRIK,** Kristiania, Manufactory. (1) Samples of Twine. (2) Samples of Nets and Seines.

48. **LYSEKNAPPEN, MIKKEL, J.,** Alverstrømmen, Fisherman and Seine Maker. (1) Samples of Seines. (2) Hand-Line and Line-Roller.


# ANDERSON, ABBOTT, OG ANDERSON,

## 37, QUEEN VICTORIA ST., LONDON, ENGLAND.

Bekjendte for deres **VOXTAFTER** i alle Fiske Districterne i Canada, Newfoundland, Sverrig, Norge, Holland, Frankrig og alle de britiske Öer.

49. **NÆSS, JOHAN, REBSLAGER,** Trondhjem, Ropemaker. The nufactory was established 1702, and has been continued since 1789, by Exhibitor's family. *arded*—Paris, 1878, Silver Medal. Collection of Samples of Ropes, Hand-Lines, Long es, and Nets.

50. **NYDALENS COMPAGNI,** Kristiania, Manufactory. Samples of nes and Nets of Cotton.

51. **STAVANGER REBERBANE,** Stavanger, Ropery. Samples of hing-Lines.

DIVISION XIII.

52. **FAGERHEIMS MEK. NOT-OG GARNFABRIK,** Bergen, Manu-tory of Seines and Nets in complete order; established 1873. Exporters to Sweden, mark, Russia, &c. Salmon Bag Net, not tanned.

53. **HANDELSFORENINGEN,** Trondhjem. The Commercial Associa-at Trondhjem. (1) Salmon Gill Net. (2) Trout Gill Net. (3) Model of a Salmon Net.

54. **LYSEKNAPPEN, MIKKEL T.,** Alverströmmen, Fisherman and e Maker. Salmon Bag Net.

55. **SELSKABET FOR DE NORSKE FISKERIERS FREMME,** gen (Norwegian Fisheries Improvement Association). Nets used in the Mjösen Lake.

DIVISION XIV.

56. **JOHANNESENS ENKE, I. CHR.,** Kristiania, Manufacturer. for Salmon Fishing.

57. **HANDELSFORENINGEN,** Trondhjem, The Commercial Association rondhjem. Salmon Light and Spear (Lyster).

DIVISION XV.

58. **JOHANNESENS ENKE, I. CHR.,** Kristiania, Manufacturer. for Trout Fishing.

DIVISION XVII.

59. **LYSEKNAPPEN, MIKKEL T.,** Alverstrømmen, Fisherman and Maker. Eel Pot.

60. **SELSKABET FOR DE NORSKE FISKERIERS FREMME,** gen (Norwegian Fisheries Improvement Association). Eel Pot, and ordinary Pots for water fishing.

DIVISION XXI.

61. **FJELD, KRISTOFFER K.,** Sartoren. (1) Fishermen's Dress. (2) 's and Women's Dress. (3) Fishermen's Boots. (4) Ditto Oil-skin Suit. (5) Ditto ared Goat-skin Suit. (6) Ditto Hand Basket, for daily use, for travelling, for visits, and going to church. Eight different sorts.

62. **FLEKKEFJORDS GARVERI,** Flekkefjord, Tannery and Export blishment. *Awarded*—Paris, 1867; Drammen, 1873; Philadelphia, 1876; Berlin, 1877; is, 1878. (1) Samples of leather. (2) Leather for Fishermen's Boots.

63. **GOTAAS, W. C.,** Bodø. Patented South-Wester.

64. **HANDELSFORENINGEN,** Trondhjem, The Commercial Associa-at Trondhjem. Fishermen's Suit.

65. **HANSEN HELLY, T.,** Moss, Manufacturer, Export. *Awarded*—is, 1878, Mention Honorable. Fishermen's Oil-skin Suit.

66. **MELLING. M. O.** Fisherman, Mosterhavn. Wood Carvings.

67. **OLSEN, JENS CHR.,** Moss Manufacturer. Grease for Fishermen's ts.

ANDERSON, ABBOTT, AND ANDERSON'S

PORTABLE INDIA-RUBBER BATHS

Fold into very small compass.

37, QUEEN VICTORIA STREET, LONDON, E.C.

**68. SCHRØDER, B. H.,** Skien, Manufacturer, Export (by Oulie & Sørensen, Agents, Kristiania). *Awarded*—Edinburgh, 1882, Diploma of Honour. Grease for Fishermen's Boots.

**69. SUND, N.,** Haugesund. (1) Fishermen's Oil-skin Suit. (2) Fishermen's Patented South-Wester.

DIVISION XXII.

**70. FINNE, Dr. EDV.,** Drøbak. (1) Cooking Apparatus that needs no Fire. (2) Apparatus for Family Use. (3) Ditto Vessels. (4) Ditto Fishing-Boats. (5) Ditto carry in a Trunk. The Apparatus will prepare food as well in an open fishing-boat as in a close travelling trunk, and needs no special attention.

DIVISION XXIII.

**71. HANDELSFORENINGEN,** Trondhjem, (The Commercial Association at Trondhjem). Model of a Fisherman's Hut at the Lofoten Cod Fishery.

**72. SELSKABET FOR DE NORSKE FISKERIERS FREMME,** Bergen (Norwegian Fisheries Improvement Association). Collection of models of fishermen's houses.

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NOTES TO CLASS III.

THE export of fish-products from Norway will average 170,000 tons net per year, 1·5 per cent. being fresh or iced fish; the remainder is salted, dried, pickled, spiced or smoked, fish oil, roe and guano. The value of the exported fish produce will average 2·4 million pounds sterling, 5 per cent. representing iced or fresh fish. If all the fish now cured for export was shipped fresh, Norway could furnish the European and transatlantic markets with about 500,000 tons of fresh cod and other large fish, besides herring, 2,500 tons of iced salmon, mackerel and halibut, now exported. The distance from the fish-stations, where the catch is made, to the usual markets, and the lack of suitable communication between European markets and the Norwegian fishing grounds, as well as the season of the year at which the fishing is carried on, make it more convenient for the fishermen to sell the catch fresh to the fish-curers, who then cure the fish in many different ways, suitable to the consumers abroad, who for hundreds of years have been dealing with Norwegian cured fish. Only during the last 20 years a trade in fresh fish of the catch in summer time has sprung up; but this trade is not as yet more than 1·5 per cent. of the export.

The following table shows the Export of the principal fish products from Norway last year:—

| | | | |
|---|---|---|---|
| Dried Fish or Stokfish of Cod, Coalfish, Haddock, Ling, &c. | 15·2 | million | kilogrammes |
| Dry Salted Codfish (also Haddock, Ling, &c.), or "Klipfisk" | 40·1 | ,, | ,, |
| Pickled Herrings | 723·2 | thousands | of hectoliters |
| Roe of Codfish | 66·5 | ,, | ,, |
| Fish Oil (the principal part of which is Cod Liver Oil) | 100·6 | ,, | ,, |

For the years 1878–1882 on an average.

| | | | |
|---|---|---|---|
| Dried Fish or Stokfish | 18·0 | millions | of kilogrammes |
| Dried Salted Codfish, &c., "Klipfisk" | 44·1 | ,, | ,, |
| Pickled Herring | 770·4 | thousands | of hectoliters |
| Roe of Codfish | 64·9 | ,, | ,, |
| Cod Liver Oil (and Fish Oil) | 135.5 | ,, | ,, |

The Export of Fish Products, 1881, was in respect to the different kinds as follows:—

| | Weight Net in kilogrammes. | Value in Kroner £1 sterling.=18 kr. |
|---|---|---|
| Salmon, Fresh and Iced | 379,670 | 569,500 |
| Mackerel, Fresh and Iced | 1,829,210 | 365,800 |
| Other kinds of Fish, Fresh and Iced | 146,890 | 52,900 |

| | Weight Net in kilogrammes. | Value in Kroner £1 sterling.=18 kr. |
|---|---|---|
| nd Split Fish | 1,770,810 | 717,300 |
| ı | 3,377,520 | 675,500 |
| nd Round Fish | 13,597,960 | 4,707,900 |
| kinds of Stokfish | 129,910 | 34,100 |
| lted Codfish, &c. (Klipfisk) | 41,918,720 | 16,012,000 |
| errings— | | |
| or Winter Herring | 4,956,524 | 835,700 |
| " Herring | 360,254 | 75,400 |
| Mixed Herring | 139,750 | 16,300 |
| Summer Herring | 71,591,388 | 13,485,800 |
| | 6,728,554 | 469,400 |
| Herring | 9,740,790 | 1,359,200 |
| kinds of Herring | 276,318 | 38,500 |
| sh, not referred to above— | | |
| rels and Kegs | 1,410,830 | 184,100 |
| sels | 14,032,660 | 1,390,100 |
| s | 1,308,216 | 734,500 |
| Salmon | 2,980 | 6,000 |
| Herring | 354,109 | 113,300 |
| | 500,990 | 400,800 |
| | 6,800 | 6,800 |
| h | 40,000 | 1,600 |
| d | 1,108 | 400 |
| Polar Bears | 176 | 600 |
| eals | 229,031 | 301,200 |
| Valrus | 37,300 | 11,200 |
| Dolphins | 18,840 | 22,600 |
| Valrus | 665 | 2,100 |
| ne | 17,120 | 154,100 |
| odfish | 6,330,000 | 1,091,900 |
| f Fish | 21,918 | 28,500 |
| ano | 8,344,550 | 1,335,100 |
| als and Whales | 602,172 | 252,100 |
| ti Oil | 43,560 | 24,200 |
| l Cod Liver Oil— | | |
| Refined | 882,291 | 681,700 |
| d | 1,164,267 | 704,200 |
| od Liver Oil | 1,839,354 | 905,100 |
| wn ditto | 2,898,717 | 1,208,400 |
| itto | 4,004,952 | 1,582,400 |
| nds of Fish Oil | 827,607 | 356,500 |
| of Fishing Oil | 165,168 | 12,400 |

alue of Exports from Norway was

| | 1880. | 1881. |
|---|---|---|
| ducts | 38·13 million kr. | 50·16 million kr. |
| of Sealing, Whaling, and Hunting | 1·41 ,, | 1·35 ,, |
| le Exports, all kinds | 108·74 ,, | 120·93 ,, |

Fish Products from Norway to Great Britain and Ireland, 1880 and 1881:—

| | Value in Kroner £1 sterling = 18·2 Kr. 1880 | 1881 |
|---|---|---|
| Fresh or Iced | 344,300 | 421,200 |
| l and other fish, Fresh or Iced | 440,100 | 898,30 |

| | Value in Kroner £1 sterling = 18·2 Kr. | |
|---|---|---|
| | 1880. | 1881. |
| Stockfish | 75,700 | 175,600 |
| Dry Salted Fish ("Klipfisk") | 1,159,400 | 1,980,900 |
| Spring or Winter Herring, Salted | 6,400 | 32,900 |
| Other kinds of Herring, Salted | 44,900 | 763,400 |
| " " Salted Fish | 44,200 | 1,500 |
| Lobster, alive | 176,700 | 206,100 |
| Skin of Seal | 437,200 | 248,900 |
| " Walrus | 8,500 | 10,100 |
| Fish Guano | 427,600 | 422,700 |
| Whalebone | 150,900 | 145,600 |
| Cod Liver Oil and Fish Oil | 846,900 | 1,411,300 |

## Division XXV.

73. **GRUNG, J.**, Kristianssund, Manufacturer. Established 1861. (1) Filter Apparatus for Cod Liver Oil. (2) Barrels of Tinned Iron Plates for Cod Liver Oil (improved). Exhibitor is the first manufacturer who introduced the improved tinned boxes for Cod Liver Oil into Norway.

74. **HELGESEN, H. A.**, Aalesund, Manufacturer. (1) Steam Apparatus for manufacturing Cod Liver Oil for Medical Purposes. (2) Barrels for Cod Liver Oil. (3) Improved Tap for Cod Liver Oil Barrels.

75. **JONASEN, G.**, Stavanger, Exporter of Iced Fish. Model of an Icehouse.

76. **MØLLER, PETER**, Lofoten and Kristiania. *Awarded.*—London, 1862, the only Medal; Bergen, 1865, Gold Medal; Stockholm, 1866, First Prize; Boulogne, 1866, Silver Medal; Paris, 1867, Silver Medal; Naples, 1871, the only Medal; Christiania, 1871, the only Medal; Copenhagen, 1872, the only First Prize; Moscow, 1872, the only First Prize; Vienna, 1873, the only Medal for Progress, and the Medal "for Merit"; Drammen, 1873, the First Prize; Philadelphia, 1876, the First Prize; Paris, 1878, the only Gold Medal, Berlin, 1880, Gold Medal. Apparatus for preparing Cod Liver Oil.

77. **SANNEM, J. A.**, Bergen, Manufacturers: Speciality, Tinned Barrels for Cod Liver Oil. Export. Established 1873. *Awarded*—Berlin, 1880, Honourable Mention. (1) Tinned Barrels for Cod Liver Oil, with wooden cover. (2) Photographs explaining the improvement.

78. **SELSKABET FOR DE NORSKE FISKERIERS FREMME**, Bergen (Norwegian Fisheries Improvement Association). Model of curing yard and drying places.

## Division XXVI.

79. **AMELN, BROTHERS**, Bergen, Fish Curers and Exporters. (1) Iceland Herring. (2) Drift Net Spring Herring. (3) Gill Net Spring Herring. (4) "K" Summer Herring, largest size (Kjøbmandssild). (5) "M" Summer Herring, next size (Middelsild). (6) "C" Summer Herring, third size (Christianiasild). (7) "B" Sprat.

81. **ASTRUP, M. H.**, Kristianssund, owner of Fishing Stations, Fish Curer and Exporter. *Awarded*—Paris, 1878, Mention Honorable; Berlin, 1880, Bronze Medal. (1) Dry Salted Codfish, for Transatlantic export. (2) Ditto, Codfish (Toston), for European markets. (3) Ditto, Ling. (4) Ditto, Cusk. (5) Ditto, Coalfish. (6) Twenty Kg.'s Ball Dry Codfish (Stockfish). (7) Pickled Herring, in glasses.

**ANDERSON, ABBOTT, OG ANDERSON,**

*37, QUEEN VICTORIA ST., LONDON, ENGLAND.*

Fabrikanter af alle Slags

**GUMMI-ELASTICUM**

til mekanisk, videnskabelig og privat Brug; ogsaa Fabrikanter af Læder og Kanvas Slanger, Læder, Gummi-Elasticum og deres Patent "CEROFILUM" Belter, Viskelæder i Plader, Rór, etc.

2. **BERG, MRS. FREDRIKKE,** Kristiania, Manufactory and Export. Anchovies, in half and quarter kegs. (2) Ditto, in glasses.

3. **BERGEN'S HERMETISKE FABRIK,** Bergen, Manufactory of erved Provisions. Established 1883. (1) Anchovies, in one, half, and quarter tins. (2) ring and Sprat, *à la Sardine*, in half and quarter tins. (3) Eels in Oil, in half tins. Eels in Oil, Boned and Skinned, in half tins. (5) Fish *à la Rouget*, in whole and half (6) Mackerel, Fish Pudding, Fish Cakes. (7) Boneless Fresh Fish, in half tins. Smoked Herring in Oil, in whole tins.

4. **BORNHOLDT, G. J.,** Kristiania, Manufacturer, Exporter. *arded*—London, 1862, Mention Honorable; Viborg, 1875, Bronze Medal; Paris, 1878, ntion Honorable; Berlin, 1880, Mention Honorable. Anchovies, in kegs and in glasses.

5. **BORTHEN, TOB. U.,** Trondhjem. Dry Salted Codfish for Havana.

6. **BRYNILDSEN D.S., D.,** Bergen. Samples of all Sorts of Dried , viz.:—(1) Stockfish of Cod, Round. (2) Ditto, of Cod, Split. (3) Ditto, of Ling, . (4) Ditto, of Cusk, Round. (5) Ditto, of Cusk, Split. (6) Ditto, of Haddock, Round. Ditto, of Coalfish, Split.

7. **CHRISTIANIA PRESERVING CO.,** Kristiania, Manufactory in nmen and Finmarken, Export. Established 1872. *Awarded*—Drammen, 1873, Bronze l; Philadelphia, 1876, Two Medals; Paris, 1878, Bronze Medal; Berlin, 1880, Silver l; Malmö, 1881, Diploma of Honour. (1) Anchovies. (2) Tinned Fish. (3) "Beef" ale.

. **CONRADSEN, JOHS.,** Stavanger, Manufacturer, Exporter. nchovies. (2) Tinned Fish.

. **FOSNA RØGERI,** Kristianssund, Fish Curing Establishment. t. *Awarded*—Edinburgh, 1882, Silver Medal. (1) Tinned Fish. (2) Smoked gs.

. **FRÖLICH, FRITZ S.,** Kristiania. Roe and Liver of Cod, mixed tted.

. **HAAR & WESNES,** Stavanger, Manufactory. (1) Anchovies, in nd in tins. (2) Ditto, Skinned and Boned.

. **HELGESEN, CORNELIUS,** Aalesund, Manufacturer. Tinned . Fish Cakes, Fish Balls, Fish Pudding, Cooked Dry Salted Codfish in Oil, Smoked n in Oil, &c.

. **HELGESEN, H. A.,** Aalesund, Manufacturer. (1) Tinned Salmon. inned Lobster.

. **HJORTH, F.,** Fredrikshald, Manufacturer, Exporter. *Awarded*—hagen 1872; Viborg, 1875, Silver Medal; Paris, 1878, Bronze Medal; Berlin, 1880, on Honorable. Anchovies, in kegs.

. **HOLM, OVE,** Bergen, Fish Curer. Fat Pickled Herrings, in kegs.

. **JOHNSEN, CHRISTIAN,** Kristianssund, Fish Curer (established and Exporter to Spain, Portugal, United States, &c. *Awarded*—Paris, 1867, Bronze l; Stockholm, 1868, Bronze Medal; Philadelphia, 1876, Silver Medal and Three mas of Honour; Paris, 1878, Two Silver Medals and Three Diplomas of Honour; n, 1880, Silver Medal and Three Diplomas of Honour; Edinburgh, 1882, Two Silver ls. (1) Dry Salted Codfish. (2) Ditto, Ling, in wooden boxes. (3) Ditto, Haddock, , and Coal Fish. (4) Boneless Fish.

. **KNUDTZON, NICOLAY H.,** Kristianssund, Fish Curer and rter. (1) Dry Salted Codfish, in wooden boxes. (2) Ditto, in tin with wooden cover.


# ANDERSON, ABBOTT, AND ANDERSON,

MANUFACTURERS OF THE BEST

## OILSKIN CLOTHING FOR SEA AND LAND PURPOSES;

**Also Oilskin Horse Clothing, Cart and Rick Covers, and their Celebrated Patent Waterproof Cloth for Covering, Driving and Carriage Aprons, &c., &c.**

(*Copy of Testimonial.*) HOME OFFICE, *Sept.* 3, 1878.

MESSRS. ANDERSON & Co.—You made me an Oilskin Coat about seven years ago, which has lasted in capital condition until this year. (Signed) A. F. O. LIDDELL.

105. **MEYER, GERDT**, Bergen, Fish Curer and Exporte
Boulogne-sur-Mer, 1866, Bronze Medal for Steam Refined Medicinal Cod
1878, Gold Medal for Cod Liver Oil for Tanning; Paris, 1878, Bronze Me
Fish; Berlin, 1880, Silver Medal for Medicinal Cod Liver Oil and Dry Salte
Salted Fish. (2) Dried Fish. (3) Dry Salted Codfish, in tin and wooden c

106. **MOE, THEODOR**, Trondhjem, Exporter. *Awarded*–
Diploma of Honour. (1) Samples of Dry Salted and Dried Fish. (2)
Herrings.

107. **MOSS PRESERVING CO.**, Moss. Manufactory
1882. (1) Tinned Fish. (2) Salmon in Oil. (3) Mackerel in Oil. (4) Fi
(5) Ditto in Wine Sauce. (6) Anchovies in Oil, in tins. (7) Ditto in Brin

108. **MOWINCKEL & SON, JOH. LUDW.**, Bergen, Fi
Exporters. Established 1805. *Awarded*—Bergen, 1865, Mention Honor
1866, Silver Medal; Paris, 1878, Silver Medal; Berlin, 1880, Silver Medal.
fish. A. Round Stockfish (2) of Cod from Lofoten. B. (3) Of Cod from
Split Stockfish (4) of Cod. D. (5) Ling. E. (6) Tusk. F. (7) Round St
G. (8) Split Stockfish of Coalfish. H. (9) Dried Sea Wolf or Wolf-fish.
Dried Fish Necks and Tails. K. (11) Dry Salted Codfish.

109. **MYHRE, FRITZ**, Trondhjem, Fish Curer and Exporte
Berlin, 1880, Mention Honorable; Edinburgh, 1882, Silver Medal. (1)
KKK, KK, K and M, in kegs. (2) Pickled Sprat, in kegs. (3) Dry Salted
Fish.

110. **MYHRVOLD, MRS. CHRISTIANE C.**, Kristiania.
Export. Established 1863. *Awarded*—Copenhagen, 1872; London, 187
Geifswald, 1881; Edinburgh, 1882. Anchovies in kegs.

111. **NILSEN, HELEN**, Bergen, Fish Curer and Exporte
Edinburgh, 1882, Diploma for Special Preparation of Herrings. (1) Pickled
$\frac{1}{2}$, $\frac{1}{4}$, $\frac{1}{8}$, $\frac{1}{16}$, and $\frac{1}{32}$ barrels. (2) In glasses. (3) Dry Salted Codfish.

112. **NORDLANDS PRESERVING CO.**, Bodø,
*Awarded*—Berlin, 1880, Diploma; Edinburgh, 1882, Diploma. (1) Fish
Fish Balls, (2) with Brown Sauce, in tins. (3) With White Sauce, in ti
Herring. (5) Smoked *Sebastes Norwegicus*.

113. **THE NORWEGIAN PRESERVING CO.**, Mandal
Established 1866. *Awarded*—Paris, 1867, Bronze Medal; Copenhagen

4. **OLSEN, CARL O.**, Stavanger, Manufacturer and Exporter. *ed*—Berlin, 1880, Bronze Medal. (1) Anchovies, in one, half, and quarter kegs. (2) ole and half tins. (3) "Appetit" Herring (Boned and Skinned Anchovies) in whole lf tins. (4) Spiced Herring, in tins.

5. **PARELIUS, NIELS R.**, Kristianssund, Fish Curer. Dry Salted a.

6. **PARELIUS & LOSSIUS**, Kristianssund, Fish Curers and Ex- to European, Transatlantic, and Australian Ports *Awarded*—Berlin, 1880, Silver (1) Dry Salted Codfish, in tins with wooden cover. (2) Boneless Codfish, in tins ooden cover. (3) Pickled Fat Herrings, in kegs.

7. **PUNTERVOLD, OLE**, Ekersund, Manufacturer. *Awarded*— Paris, Mention Honourable; Berlin, 1880, Mention Honorable. Anchovies in kegs.

8. **PUNTERVOLD, T. H.**, Ekersund. Fresh Fish, in kegs, Preserved.

9. **RØNNEBERG, T.**, Stavanger, (by Bergesen and Blaauw), Manu- Established 1882. Collection of Preserved Fish:—Fish Pudding, Fish Gratin, , Mackerel, Halibut, Fish Balls, Fish Cakes, and Lobster.

10. **SCHREINER & NIELSEN**, Stavanger, Manufactory. Anchovies Appetit" Herring.

11. **SIVERTSEN, S. M.**, Mosjøen, Manufacturer. Smoked Fat Herring in quarter, half, and whole tins.

12. **SMITH, GINA**, Kristiania, Manufactory (established about the year Export to Hamburg, Copenhagen, and Amsterdam. *Awarded*—London, 1862; Bergen, Paris, 1867; Stockholm, 1866; Boulogne-sur-Mer, 1866; Lysekil, 1868; Drammen, Medal; Naples, 1871, Silver Medal; Vienna, 1873, Diploma of Honour; London, 1874, Philadelphia, 1876, Medal; Berlin, 1880, Silver Medal. Anchovies.

13. **STAVANGER PRESERVING CO.**, Stavanger, Manufactory, to England, France, Netherlands, Germany, United States, and East Indies. *Awarded* s, 1875; Brussels, 1876; London, 1878, Silver Medal; Philadelphia, 1876, Medal; 1878, Silver Medal; Berlin, 1880, Gold Medal; Edinburgh, 1882, Silver Medal; ger, 1182, Silver Medal. Collection of Preserved Fish, Smoked Fish, Pickled Herring, chovies, in tin.

14. **STOCKFLETH, MRS. GINA**, Bergen, Manufactory. *Awarded*— 1878: Berlin, 1880. Anchovies, in kegs and in tins.

15. **TELLEFSEN, MRS. RINA**, Kristiania, Manufactory and Export. *ed*—Berlin, 1873; London, 1873; Paris, 1875; Philadelphia, 1876; Paris, 1878; Berlin, Edinburgh, 1882. Anchovies, in whole, half, and quarter kegs.

16. **THESEN JOHAN, & CO.**, Bergen, Fish Curers and Exporters. *ed*—Berlin, 1880, Silver Medal. Dried (1) Codfish, Round. (2) Codfisn, Split. ddock, Round. (4) Ling, Split. (5) Tusk, Split. (6) Tusk, Round. (7) Coalfish. y Salted Codfish from Lofoten, from Finmarken, and third quality. (9) Cuts of Dried ecks. (10) "Tails."

17. **THORSEN, H.**, Sunde, Søndhordland, Manufacturer and Exporter. ished 1862. *Awarded*—Berlin, 1880, Diploma. (1) Anchovies in tins. (2) Anchovies in tins. (3) Sprats *à la Sardine*, in tins.

18. **TROMSØ COLLECTIVE EXHIBITION**, Tromsø (Andr. d, O. Albrethsen, P. Hansen and Co., M. W. Holmboe & Son, Mack & Co., Anton Collection of Samples of Dried Fish.

19. **VALVATNE, H.**, Sunde, Søndhordland, Manufacturer. *Awarded*— 1880, Bronze Medal. Anchovies, in tins.

20. **WAHL & CO., EDW.**, Trondhjem, Fish Curers and Exporters. *ed*—Berlin, 1880, Bronze Medal. Pickled Herrings and Dried Fish.


# ANDERSON, ABBOTT, & ANDERSON,

**37, Queen Victoria Street, Londen, Engeland,**

Beroemd door hunne GEWAST TAFFEN KLEEDINGSTUKKEN in alle Visschersplaatsen van Canada, New Foundland, Zweden, Noorwegen, Holland, Frankrijk en het geheele gebied der Britsche Eilanden.

DIVISION XXVII.

132. **ASTRUP, M. H.**, Kristianssund. (1) Samples of Medic
Liver Oil. (2) Roe of Codfish.

133. **BORTHEN, TOB. U.**, Trondhjem, Manufacturer and I
Manufactories at Halten, Lofoten, and in Finmarken. (1) Samples of Medicinal
Oil. (2) Steam Refined Medicinal Cod Liver Oil. (3) Roe of Codfish.

134. **BRANDTZÆG, ANTHON M.**, Appleværr, Manufactu
Exporter. Steam Manufactured Medicinal Cod Liver Oil in Samples.

136. **DAHL, N. P.**, Molde, Manufacturer and Exporter. *Awarded*-
1880, Gold Medal; Edinburgh, 1882, Diploma. Medicinal Cod Liver Oil.

137. **GØRVELL, A. FRED.**, Molde, Manufacturer and Exporter.
cinal Cod Liver Oil.

138. **HENRIKSEN, T. H.**, Tromsø. Medicinal Cod Liver Oil.

139. **HOEL, P. C.**, Aalesund, Exporter. Manufactories at Runds
Sjeide. *Awarded*—Berlin, 1880, Diploma of Honour. Steam Refined Medicinal
Oil. Established 1859.

140. **ISDAHL & CO.**, Bergen. Manufactories at Lofoten and in
ken. Exporters to United States, France, England. *Awarded*—Paris, 1878, Silv
Bronze Medal and Mention Honorable; Berlin, 1880, Bronze Medal. Medicinal Cod

141. **JERVELL, OTTO S.**, Aalesund. Manufactories at Søndi
Lofoten, Export. *Awarded*—Boulogne-sur-Mer, Gold Medal (to the present M
Exhibitor's Manufactories). Steam Refined Medicinal Cod Liver Oil.

142. **JOHNSEN, CHRISTIAN**, Kristianssund, Fish Curer and I
(1) Medicinal Cod Liver Oil. (2) Roe of Codfish. (3) Isinglass and Fish Glue,
Fish Tongues and Salted Sounds.

143. **KNUDTZON, NICOLAY, H.**, Kristianssund, Manufact
Exporter. Steam Refined Medicinal Cod Liver Oil.

144. **KONOW, WOLLERT**, Bergen. Manufactory at Lokøen
Established 1883. (1) Fish Oil. (2) Isinglass. (3) Fish Glue.

145. **LANGE, JOHAN**, Bergen. Medicinal Cod Liver Oil.

146. **LEHMKUHL, J. E.**, Bergen. (1) Roe of Codfish, 1st
qualities. Steam Refined Medicinal Cod Liver Oil.

147. **LOTHE, JOHAN**, Bergen, Manufacturer and Apothecary.
Cod Liver Oil.

148. **MEYER, GERDT**, Bergen. Medicinal Cod Liver Oil.

149. **MØLLER, PETER**, Kristiania, Manufacturer, Inventor
porter. *Awarded*—London, 1862, the only Medal; Bergen, 1865 Gold Medal;
1866, First Prizee: Boulogne, 1866, Silver Medal; Paris, 1867, Silver Medal; N
the only Medal; Christiana, 1871, the only Medal; Copenhagen, 1876, the only
Moscow, 1872, the only First Prize; Vienna, 1873, the only Medal for Progress an
"for Merit;" Drammen, 1873, the First Prize; Philadelphia, 1872, the First
1878, the only Gold Medal; Berlin, 1880, Gold Medal. Inventor of the method
turing steam refined cod liver oil. (2) Steam Refined Cod Liver Oil.

150. **MOWINCKEL & SON, JOH. LUDW.**, Bergen, Exp
Medicinal Cod Liver Oil. (2) Steam Refined Medicinal Cod Liver Oil.

151. **OLSEN & CO.**, Vardø. Samples of Medicinal Cod Liv

152. **THESEN & CO., JOHAN**, Bergen. (1) Steam Refine
Cod Liver Oil. (2) Natural Medicinal Cod Liver Oil.

**ANDERSON, ABBOTT, OG ANDERSO**

*37, QUEEN VICTORIA STREET, LONDON,*

ENE FABRIKANTER til det Londonske Politi af deres
*Vandtætte* Politi-Slag, saaledes som de bæres af den vi
Engelske, Irske og Skotske Politistyrke.

153. **TROMSØ COLLECTIVE EXHIBITION,** Tromsø (Andr. gaard, O. Albrethson, P. Hansen & Co., M. W. Holmboe & Son, Mack and Co. Anton Næss). edicinal Cod Liver Oil.

DIVISION XXVIII.

154. **HENRIKSEN, J. H.,** Tromsø. Ice.

155. **NÆSØEN'S ICE-EXPORTING COMPANY,** per Ths. Joh. ftye & Son, Kristiania, Export. *Awarded*—Brussels, 1876, Mention Honorable; Paris, 78, Silver Medal. Ice and Model of Ice-house.

156. **NORD, M. E.,** Kristiania, Manufacturer of Refrigerators. Refrigera- and Freezer.

157. **SVARTISEN'S COMPANY,** Bergen. Export Company. Address: eapotheket, Bergen. Owners of a part of the glacier Findören, north of Trondhjem and iles south of Bodö. The owners' portion can furnish 25 millions of tons block-ice of same lity as exhibited samples, that will melt ten per cent. slower than common ice. For sale or ing for five or ten years. Samples of Ice from the Glacier Findören.

DIVISION XXIX.

158. **ASTRUP, M. H.,** Kristianssund. Cod Liver Oil.

159. **BORTHEN, TOB. U.,** Trondhjem. (1) Cod Liver Oil, bright Ditto, Brown.

160. **BREKKE, BERNHRD,** Trondhjem, Manufactory and Export. Fish no.

162. **HOLMBOE, ANTON,** Vardø. Fish Guano.

163. **HVALFANGERSELSKABET, "FINMARKEN"** (Whale Fish- Co.), Tonsberg, Fishing Company and Exporters. (2) Three Samples of Whale Oil. (3) ple of Fish Guano, prepared from the flesh and bone of Whales.

164. **ISDAHL & CO.,** Bergen, Manufacturers and Exporters. Fish Oil for Tanning. (2) for Technical Purposes.

165. **JOHNSEN, CHRISTIAN,** Kristianssund, Manufacturer and Ex- ter. (1) Fish Oil for Tanning and other Trade Purposes. (2) "Footing" of Fish Oil. (3) h Guano.

166. **KONOW, WOLLERT,** Bergen, Manufactory at Lokøen Bergen. ablished 1883. (1) Fish Oil, Fish Guano and Manure. (2) Fish Glue.

167. **LANGE, JOHAN,** Bergen. Samples of Fish Oil.

168. **LEHMKUHL, J. E.,** Bergen. Fish Oil and Fish Roe.

169. **MEYER, GERDT,** Bergen. Fish Oil.

170. **MOWINCKEL & SON, JOH. LUDW.,** Bergen. Cod Liver Oil. Bright. (2) Ditto Pale Brown. (3) Brown.

171. **DET NORSKE FISKEGUANOSELSKAB,** Lerosen Svolvær, nufacturers of Fish Guano, Exporters. Fish Guano.

172. **OLSEN & CO.,** Vardø. Samples of Fish Oil.

173. **THESEN & CO., JOHAN,** Bergen. Bright, Pale Brown, and own Cod Liver Oil, and Fish Oil.

174. **TROMSØ COLLECTIVE EXHIBITION,** Tromsø (Andr. gaard, O. Albrethsen, P. Hansen & Co., M. W. Holmboe & Son, Mack & Co., Anton Næss). mples of Fish Oil.

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Copi af en **ANBEFALING,** som **ANDERSON, ABBOTT, og ANDERSON** have faaet for deres Vantætte Politi-Slag og Benbedækning.

Politi-Contoret,
4, Whitehall Place, S.W., 21 *Juli* 1869.

NYE PRÖVE-SLAG.

Kort Udtog af Superintendenternes Raport om, hvorledes Pröve-Slagene, leverede til A, B, C, K, N og R Afdelingerne i Januar 1868, have holdt sig.

Superintendenterne angive, at Slagene langt overgaa de gamle Mönstre, have holdt sig godt, ere ulgjennemtrængelige for Fugtighed, brække ikke, ere endnu i god Condition, og i R Afdelingen ere Folkene af den Mening, at de ere de bedste Slag, som de nogensinde have havt. B Afdelingen anse Mönstret No. 2 for noget bedre end No. 1.

(*underteignet*) THOS. KITTLE, Superintendent.

## Division XXXII.

175. **BERNHOFT, ALBERT,** Bodø, Fish Curer and Proprietor. Ashes of Seaweeds from Lofoten Islands.

176. **BORTHEN, TOB. U.,** Trondhjem. Pure Eider Down.

177. **BRANDT, C.,** Bergen, Manufacturer and Exporter. *Awarded*—London, 1862; Paris, 1867; Copenhagen, 1872; Kristiania, 1873; Vienna, 1873; Drammen, 1873; Philadelphia, 1876; Paris, 1878, Gold Medal; Cleve, 1881, Gold Medal; Berlin, 1880, Silver Medal. (1) Prepared Skins of Ice Bears, Seals, Otters, &c. (2) Prepared Skins of Aquatic Birds. (3) Carpets and Covers prepared from skins of the Eider Duck and other Aquatic Birds.

178. **FEDDERSEN & NISSEN,** Hammerfest, Fish Curers and Exporters (1) Tusks of Walrus. (2) Head of Walrus.

179. **TROMSØ COLLECTIVE EXHIBITION,** Tromsø (Andr. Aagaard, O. Albrethsen, P. Hansen & Co., M. W. Holmboe & Son, Mack & Co., Anton Nissen) (1) Eider Down. (2) Head of Walrus.

## Division XXXIII.

180. **ANDERSEN, EMIL,** Kristiania (Lakksgaden 55), Manufacturer and Exporter. *Awarded*—Paris, 1878, Mention Honorable; Berlin, 1880, Mention Honorable. Kegs for Anchovies.

181. **IENSEN, OLUF,** Bergen, Manufacturer. Model of Floating Fish Well.

182. **JOHNSEN, CHRISTIAN,** Kristianssund, Manufacturer and Exporter. (1) Samples of Barrels (made by machinery), iron hooped, wood hooped, of pine and of birch. (2) Staves, Prepared and Rough Hewn. (3) Boxes for Cured Fish. (4) Oak Barrels for Cod Liver Oil.

183. **LYSEKNAPPEN, MIKKEL I.,** Alverstrømmen. (1) Model of a Floating Fish Well. (2) Fish Bucket.

184. **MEYER, G. A.,** Aastvedt, Bergen, Manufacturer and Inventor. *Awarded*—Boulogne-sur-mer, 1866, Bronze Medal; Berlin, 1880, Bronze Medal. Barrels and Kegs for Pickled Herrings.

185. **MOE, THEODOR,** Trondhjem. Improved Barrel for Anchovies (Exhibitor's Invention).

186. **SELSKABET FOR DE NORSKE FISKERIERS FREMME,** Bergen (Norwegian Fisheries Improvement Association). (1) Floating Fish Wells as used on the West Coast of Norway. (2) Coopers' Tools, small collection. (3) Knives used for gutting herring. (4) Axe for Cutting Dry Fish.

## Division XXXV.

187. **BYGDØ KONGSGAARD** (the Royal Farm, Bygdo), by Hjelt, Superintendent and Chamberlain, Kristiania. Three models of (old) Hatching Apparatus.

188. **FJELDS FISKERISELSKAB,** Bergen. *Awarded*—Edinburgh, 1882, Silver Medal. (1) Hatching Apparatus for Salmon and Trout. (2) Transport Apparatus for Fish Ova.

189. **LANDMARK, A.,** Inspector of Fisheries, Kristiania, Inspector of the Fresh Water Fisheries of Norway. Apparatus for transporting Fresh Impregnated Fish Ova.

190. **WALLEM, FREDRIK M.,** Bergen. (1) Apparatus for transporting Ova of Salmon and Trout, long distances. (2) Apparatus with Refrigerator for transporting Fry of Salmon and Trout.

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## Division XXXVI.

**91. FJELDS FISKERISELSKAB,** Bergen. Development of Salmon, it and Char, represented by specimens of the parent fish, ova and fry, in spirits.

**92. SARS, PROFESSOR G. O.,** Kristiania. (Exhibits in the Col- on of Selskabet for de Norske Fisheries, Fremme). *Awarded*—Paris, 1867, Silver Medal the Societé d'Acclimation at Paris. (1) Development of the Cod (*gadus morrhua*), ained by a series of fifty-six coloured drawings on seven plates, made by the Exhibitor ng his visits to the Lofoten Islands in the years 1865-69. Plate I.—Fig. 1. Part of an ian sac not fully matured, showing the disposition of the ova in leaf-like clufters con- ing to the interior cavity of ovisac. Fig. 2. Two immature ovicells. Fig. 3. An egg from varian sac, figured No. 1. Fig. 4. Four eggs from a ripe ovisac, showing the blood-vessels ying in the surrounding capsules. Fig. 5. A ripe egg protruding from its capsule. 6. A ripe egg pressed out from the genital duct of a spawny cod. The germinal layer, st uniformly spread over the yolk, is about to accumulate on the lower pale of the egg. 6a. Part of the germinal layer of the same egg as seen under a very high magnifying r. Fig. 7. The same egg after having floated some time in the water, without being gnated, figured in two different aspects. The germinal disc has been formed at the pole, but no segmentation has taken place in the same. The small oil-globules of the nal layer are partly run together in larger globular masses, of which a row surrounds the nal disc. The micropyle is seen as a small spot in the outer egg-membrane somewhat to ght in the lower part of the egg. Fig. 8. A small portion of a ripe miltsac, showing the ramifying bloodvessels. Fig. 9. Spermatozoa as seen through a very powerful micro- Fig. 10. The micropyle-apparatus with the surrounding area, seen from the outer face, magnified. Fig. 11. Segment of a ripe egg with the micropyle-apparatus seen in , demonstrating the impregnation. Figs. 12–24. Segmentation of the germinal disc. (In 12–14 and 23 and 24 the egg is figured in two different aspects, so as to exhibit the nal disc both from the outer face and in profile; in Figs. 15–22 only in the former on.) Fig. 12. A slight vertical depression has appeared in the middle of the germinal which is surrounded, as in the following stages, by a clear zone. Fig. 13. The depression ken the form of a distinct furrow on instriction dividing the disc vertically. Fig. 14. primary segmentation in two halves is completed. Fig. 15. The horizontal furrow has ed in the two primary divisions. Fig. 16. The disc is divided into four segments. 7. A vertical furrow has appeared in every one of the four segments. Fig. 18. The disc ided into eight distinct segments and at the same time has assumed a somewhat oblong Fig. 19. The disc is divided into sixteen segments, still forming a single layer. Fig. 20. egmentation has continued, the disc being now composed of several layers of cellular ns and showing a more regular form. Fig. 21. The divisions are still more numerous ely pressed together, assuming a polygonal shape. Fig. 22. The disc is composed of ous small segments or cells. Fig. 23. The segments are so numerous and small, as to he disc an almost granular structure. The upper face is still plane. Fig. 24. The ntation is completed, and the disc has contracted itself and assumed a biscuit-like form per face being now strongly convex, while a thin marginal layer of small clear cells has formed in the ægratorial zone of the disc fifth day after impregnation. Plate II.—(2) ation of the Blastoderm and development of the embryo, 1865. (All the eggs are figured different aspects so as to exhibit the embryo both from the dorsal face and in profile.) 5. Egg on the sixth day after impregnation. The upper convexity of the germinal disc ssumed a somewhat irregular shape, being on one side, where the embryo will develop more prominent. The cells of the disc are about to separate into two distinct layers, the epiblast) forming a thinner girdle around the central part. Fig. 26. The embryonal ng is distinctly seen on the one side. The upper surface or the germinal disc is sunk middle so as to give the whole the form of a small cup occupying the lower pole of the (the incipient blastoderm), the peripheral girdle being now somewhat denser as the al part. Fig. 27. The blastoderm has been formed, and begins to grow up on the sides of gg, spreading over the yolk, while the embryonal space advances downwards as a broad gular lobe, showing at the apex the first appearance of the embryo (the brain and part of pinal marrow). Fig. 28. The blastoderm has reached the ægratorial zone of the egg, and

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making any pulsations. The muscle-plates are distinctly seen on both sides c
Fig. 33. The tail of the embryo is rather prolonged, advancing over the yolk
clear natatory fold. The eyes are slightly pigmented, and show their lenses
The heart has assumed a fusiform shape and a somewhat obliquely transverse
ing slow pulsations. Beneath the pectoral fins a small swelling is seen repre
and behind it the alimentary canal is about to be formed. Faint ramifica
have appeared on the back of the body. Fig. 34. The embryo is rather
encircling now the whole circumference of the yolk, the tail being considera
as to meet or go beyond the snout: on the last the nasal pits are distinctly se
escape not rarely from the egg in this stage. (See Plate III., Fig. 37.) Fig. 3
stage of development, eighteenth day after impregnation. The embryo r
energetically in the interior of the egg, assuming different positions, as sh
figures. The eyes are fully pigmentated, and the pigmentary ramifications
accumulated in several limited parts, forming two dark transverse bands ov
another along the upper side of the alimentary canal. Fig. 36. Young at
hatching. PLATE III.—(4) Development of the young after hatching, 1865
Young recently hatched, answering the stage as shown in Plate II., Fig. 34.
very large and globular, and the fore-part of the body still somewhat deflexed.
is distinctly seen occupying the axis of the very narrow body. Fig. 37a. The
beneath. Fig. 38. Young a litte more developed, answering the stage Plate I
36. The yolk-sac has somewhat diminished, but the mouth is still closed.
the eyes and body is more pronounced. Fig. 39. Young eighth day after
yolk-sac is almost entirely absorbed and the mouth is formed. The alimentar
but still simple, not convoluted. The choroidal fissure of the eyes distinct
ceding stages has disappeared, and the pigmentary bands of the body are c
The same seen from above, showing the hoodlike expansion of the natatory fo
part of the body. Fig. 40. Young on the fourteenth day after hatching.
completely absorbed, and the alimentary canal is about to make its first winc
jaw is considerably advanced beyond the upper, giving the young a
physiognomy. At the end of the tail a few radiating stripes are seen as th
formation of the caudal fin. Fig. 41. Young of 11 mm. length, caugh
of the sea in the latter part of May. The pigmentary stellated spots are
distributed over the body, the two caudal bands being indistinct. The alin
made a complete turn in the hinder part and is filled with orange-coloured
the visceral cavity is seen the air-bladder shining through the pellucid body
of the pectoral fins the coraco-scapular rods are formed. The caudal fin has
numerous radii passing both from the upper and lower sides, the end of t
protruding in the middle. Two very slight folds on the upper and lower sid

days of June. The radii of the two hinder dorsal fins and the anal fins are distinctly seen, a first sign of the foremost dorsal fin and of the abdominal fins has made its appearance. caudal fin is still more developed, and the embryonal natatory fold is about to be rbed, forming slight instrictions between the developing persistent fins. Fig. 43. Young 2 mm. length, caught at the surface of the sea in the middle of June. The primitive tory fold is almost quite obliterated, and the persistent fins are formed, the foremost l still being very small. The peritoneal lining of the visceral cavity is developed, con- g the viscera. PLATE IV.—(3) Development of the young Cod, continued, 1866–1867. 44. Young Cod of 35 mm. length, caught beneath a jelly-fish (*Cyanea capillata*), first of July. Every trace of the primitive natatory fold has now disappeared, and the per- t fins are developed, the foremost dorsal and the abdominals, however, being still rather . The cirrus at the end of the lower jaw is about to be formed. The pigmentary spots body are increased in number, and form on each side six or eight faint transverse bands. 45. Young Cod of 55 mm. length, caught from smaller shoals at the surface of the sea, in icinity of the shore, first days of August. All the fins have assumed their definitive and the colour of the body has changed in a remarkable manner, light brown spots alter- g rather regularly on the sides. Fig. 46. Young Cod of 60 mm. length, caught at the n, close to the shore, middle of August. The colour of the body is darker, and the nating spots more pronounced and quadrangulars forming four longitudinal rows on each The cirrus of the lower jaw is fully developed and protracted. Fig. 47. Young Cod of m. length, caught under similar circumstances and at the same time as the former. The spots are about to flow together, and along the lateral line four or five very light patches iscerned. Fig. 48. Young Cod of 100 mm. length, caught near the shore along with er ones in the latter part of August. The colour is again about to change, the original spots now having quite flowed together, forming the ground colour of the body, while irregularly formed spots have made their appearance disposed on each side in three tudinal rows, the middle one occupying the lateral line. Fig. 49. Young Cod of 166 mm. h, caught at a depth of 10 to 12 fathoms in the vicinity of the shore, natural size. The r now is about to assume the one characteristic of the species. PLATE V.—(5) Develop- of the Young Cod, continued. Figs. 50–52. Three specimens of somewhat different r, caught December, 1868, at the depth of 10 to 12 fathoms in the vicinity of the shore, al size. In the upper figure the colour is that which is most frequently met with. The le one exhibits the peculiar red-brown hue and robust form not rarely observed in speci- which visit stony bottoms with a rich vegetation of red alga. The lower figure shows ss vivid colour and more slender form, which the young Cod often assume after having for some time on a sandy bottom of the sea. PLATE VI.—(6) Development of the g Cod, continued. Figs. 53 and 54. Two specimens of somewhat different colour and size, ht off the shore at a depth of 20 to 30 fathoms, January, 1869, the upper figure natural the lower one two-thirds natural size. These specimens are about one year old. E VII.—Fig. 55. Cod of 20 in. length, not yet adult, caught in March, 1869, at a depth to 40 fathoms, half natural size. Fig. 56. Adult spawny Cod of 33 in. length, caught on shing banks at a depth of 80 to 100 fathoms, one-third natural size, March, 1869.

DIVISION XXXVII.

93. **BYGDØ KONGSGAARD** (the Royal Farm, Bygdø), by Holst, Superintendent and Chamberlain, Kristiania. Model of the Fish Ladder in the Sarpsfos, tructed by Mr. Løvstad.

94. **LANDMARK, A.**, Inspector of Fisheries, Kristiania; Inspector of Freshwater Fisheries of Norway. *Awarded*—Edinburgh, 1882, Silver Medal. Drawings Map and Explanation of the Salmon Ladder at Sireaaen.

DIVISION XL.

95. **MOHN, H.**, Professor, Kristiania. *Awarded*—Berlin, 1880, Gold al. (1) Chart of the depths of the Norwegian Sea and of the Arctic Ocean. (2) Map ving the Distribution of Temperature in the Norwegian Sea and of the Arctic Ocean tical sections).

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DIVISION XLV.

196. **SELSKABET FOR DE NORSKE FISKERIERS FREMME,** Bergen (Norwegian Fisheries Improvement Association). Collection of Entozoa and Epizoa.

DIVISION XLVI.

197. **SELSKABET FOR DE NORSKE FISKERIERS FREMME,** Bergen (Norwegian Fisheries Improvement Association). Various Mollusca from the West Coast of Norway.

198. **TROMSØ MUSÆUM,** Tromsø. Various Objects from the Arctic Sea.

DIVISION XLVII.

199. **SELSKABET FOR DE NORSKE FISKERIERS FREMME,** Bergen (Norwegian Fisheries Improvement Association). Various Starfishes and Sea Urchins from the West Coast of Norway.

DIVISION L.

200. **SELSKABET FOR DE NORSKE FISKERIERS FREMME,** Bergen (Norwegian Fisheries Improvement Association). Various Crustacea from the West Coast of Norway.

201. **TROMSO MUSÆUM,** Tromsø. (1) Buccinum undatum. (2) Buccinum parvulum. (3) Buccinum Donovani. (4) Buccinum fragile. (5) Buccinum conideum. (6) Buccinum grönlandicum. (7) Buccinum fiumarchianum. (8) Buccinum Humphreysianum. (9) Neptunea despecta. (10) Volutopsis norvegica. (11) Chrysodomus Turtani. (12) Sipho islandicus. (13) Sipho glaber. (14) Sipho tortuosus. (15) Sipho Sarsic. (16) Sipho latericeus. (17) Boreofusus Berniciensis. (18) Sipho fusiformis. (19) Hyas araneus. (20) Hyas coarctatus (21) Eupagurus bernhardus. (22) Eupagurus pubescens. (23) Galathea strigosa. (24) Crangon boreas. (25) Crangon vulgaris. (26) Sabinea 7 carinata. (27) Hippolyte gaimardi. (28) Hippolyte polaris. (29) Hippolyte spinus. (30) Hippolyte turgida. (31) Hippolyte pusiola. (32) Pandalus annulicornis. (33) Euphausia inermis. (34) Thysanopoda norvegica. (35) Mysis inermis. (36) Mysis oculata. (37) Mysis mixta. (38) Lamprops fasciata. (39) Lamprops fuscata. (40) Leptomysis nasicus. (41) Eudorella emarginata. (42) Diastylis Rathkii. (43) Diastylis Edwardsii. (44) Diastylis Goodsiri. (45) Apseudes spinosus. (46) Oga Strömii. (47) Idothea tricuspidata. (48) Astacilla longicornis. (49) Janira maculata. (50) Parathemisto abyssorum. (51) Hyale Nilssonii. (52) Locarnes Vahlii. (53) Hippomedan Holbölli. (54) Eurytenes gryllus. (55) Orchomene minutus. (56) Anonyx lagena. (57) Anonyx gulosus. (58) Onisimus plautus. (59) Phoxus Holbölii. (60) Syrrhoï crenulata. (61) Oediceros saginatus. (62) Oediceros lynceus. (63) Monoculodes borealis. (64) Monoculodes longirostris. (65) Monoculodes latimanus. (66) Aceros phyllanyx. (67) Pleustes panopla (68) Acanthozone cuspidata. (69) Halirages tridentatus. (70) Halirages fulvocinctus. (71) Calliopius laviusculus. (72) Amphitopsis latipes. (73) Pardaliscа cuspidata. (74) Gammarus locusta. (75) Melita dentata. (76) Amathilla Sabini. (77) Ampelisca macrocephala (78) Ampelisca Eschrichtii. (79) Haploops tubicola. (80) Byblis Gaimardii. (81) Protomedeia fasciata. (82) Amphithoë podoceroides. (83) Podocerus angripes. (84) Unciola irrorata. (85) Caprella septentrionalis. (86) Cyamus boopis. (87) Gammarus pulex. (88) Tritropis inflata. (89) Vertumnus serratus. (90) Metopa sölsbergi.

DIVISION LI.

202. **FOSS, O. P.,** Vestfossen Drammen, Exhibits in the Collection of "Selskabet for de norske Fiskeriers Fremme." Fishes from the Drammens River and its tributary lakes and streams, in spirits.

203. **HAALAND, ELIAS,** Bergen Museum. (1) A Stuffed Halibut, weighing when alive 254 lbs. (2). A Stuffed Eel, 7½ feet long. (3) A Stuffed Ling, 5½ feet long. (4) Stuffed Codfish, Coalfish, Sebastes Norwegius, Sea-wolf, Tusk, &c.

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**204. HANDELSFORENINGEN,** Trondhjem (Commercial Association at Trondhjem). Stuffed Fishes: (1) Greenland Shark; (2) Seal; (3) Lampis guttatus; (4) Lump Fish; (5) Wolf Fish; (6) Plaice; (7) Turbot; (8) Skate; (9) Pleuronectus microcephalus; (10) Ling; (11) Cod; (12) Coalfish; (13) Haddock; (14) Norwegian Haddock; (15) Gurnard.

**205. HETTING, M. G.,** Kristiania. Landlocked Salmon, in spirits.

**206. LØKKE,** Bodø. Fry of Sebastes Norwegicus, in spirits (taken out alive from the mother fish).

**207. MØLLER, PETER,** Kristiania. Some Stuffed Saltwater Fishes.

**208. NEEGAARD, O. N.,** Stai, Osterdalen (Exhibits in the Collection of "Selskabet for de norske Fiskeriers Fremme"). Collection of Fishes from the River Glommen and its tributary streams, in spirits.

**209. SELSKABET FOR DE NORSKE FISKERIERS FREMME,** Bergen (Norwegian Fisheries Improvement Association). (1) Gasterasteus aculeatus, Lin. (2) Spinacea vulgaris, Fleming. (3) Sebastes imperialis, Cuv. (4) Cottus scorpius, Fabr. (5) C. poriclopus. (6) C. bubalis, Enphr. (7) Phobetor ventralis Cur. (8) Trigla gurnardus, Lin. (9) Aspidophorus cataphractus, Lin. (10) Agonus cataphractus, Lin. (11) Trachinus draco, Lin. (12) Scomber scombrus, Lin. (13) Gobius microps, Kroyer. (14) Gobius minutus, Gmel. (15) G. pictus, Mahn. (16) G. niger, Lin. (17) G. Ruthensparri, Enphr. (18) Latrunculus Stuwitzii, Düb. (19) Cyclopterus lumpus, Lin. (20) Liparis, Montagniu, Don. (21) Lophius piscatorius, Lin. (22) Lumperius lampetraformis, Wall. (23) Anarrhichas lupus, Lin. (24) Zoarces vivaparus, Lin. (25) Mugil septentrionalis, Günth. (26) Two Labrus maculatus, Nils. (27) Two Labrus mixtus, Lin. (28) Crenilabrus melops, Lin. (29) Ctenolabrus ruprestric, Lin. (30) Acantholabrus exoletus, Lin. (31) Macronus nepestris. Block. (32) Gadus morrhua. Lin. (33) Ditto, three years old. (34) Ditto, two years old. (35) Ditto, one year old. (36) Gadus æglefinus, Lin. (37) Ditto, two years old. (38) Ditto, one year old. (39) Gadus merlangus, Lin. (40) Gadus minutus, Lin. (41) Gadus Esmarkii, Lin. (42) Gadus poutassou, Risso. (43) Gadus pollachius, Lin. (44) Gadus virens, Lin. (45) Ditto, three years old. (46) Ditto, two years old. (47) Ditto, one year old. (48) Merlucius vulgaris, Fleming. (49) Phycis furcatus, Fleming. (50) Lota vulgaris. (51) Molva vulgaris, Nils. (52) M. abyssorum, Nilss. (53) Motella cimbria, Lin. (54) Motella mustela, Lin. (55) Motella tricirrata, Nils. (56) Brosmius vulgaris, Cuv. (57) Ditto, young. (58) Ammodytes tobianus, Lin. (59) Two A. lanceolatus, Lin. (60) Hippoglossus vulgaris, Elm., young. (61) H. Limandoides, Bloch. (62) Bhombus maximus, Lin. (63) Zeugopterus punctatus, Bloch. (64) Z. megastomus, Don. (65) Two Pleuronectus cynoglussus, Lin. (66) Pleuronectus platessa, Lin. (67) Two P. microcephalus, Don. (68) Two P. limanda, Lin. (69) P. flesus, Lin. (70) Solea vulgaris, Quens. (71) Maurolicus borealis, Nils. (72) Salmo, salar, Lin. (73) Ditto, four years old. (74) Ditto, three years old. (75) Ditto, two years old. (76) Ditto, one year old. (77) Two S. eriox, forma fario, Lin. (78) S. eriox, forma trutta, Lin. (79) S. Alpinus, Lin. (80) Osmerus eperlanus, Lin. (81) Two Mallotus villosus, Müll. (82) Two Coregonus oxyrrhynens, Lin. (83) C. lavaretus, Lin. (84) C. albula, Lin. (85) Thymallus vulgaris, Nils. (86) Argentina sphyrœna, Lin. (87) A. silus, Arc. (88) Esox lucius, Lin. (89) Belone vulgaris, Cuv. (90) Carassius gibelio, Bloch. (91) Leuciscus rutilus, Lin. (92) L. cephalus, Lin. (93) Phoxinus aphya, Lin. (94) Abrannis Brama. (95) Aspius rapax. (96) Alburnus lucidus. (97) Twelve Clupea harengus, Lin. Collections in respect of various localities and age. (98) C. sprattus, Lin. (99) Ditto, two years old. (100) Ditto, one year old. (101) Alosa communis, Liv. (102) Two Anguilla vulgaris, Turt. (103) Conger vulgaris, Yarrel. (104) Siphonostoma typhle, Lin. (105) Syngnathus acus, Lin. (106) Nerophis œquoreus, Lin. (107) N. ophidion, Lin. (108) Two Chimæra monstrosa. (109) Scyllium annulatum, Nils. (110) Two Acanthias vulgaris, Risso. (111) Two Syinax nigar, Bonap. (112) Raya radiata, Don. (113) Petromyzon marimus, Lin. (114) Myzine glutinosa, Lin. (115) Collections of fish eggs and liver, including the following species: Sebastes norwegicus, Codfish, Haddock, Whiting, Coalfish, Ling, Halibut, Turbut, Herring, Dogfish, &c.

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DIVISION LIV.

215. **BRANDT, C.**, Bergen. Stuffed Animals. Specimens o
Seal, &c.

DIVISION LV.

216. **THE NORWEGIAN NORTH-ATLANTIC EX**
**1876-1878.** Report by Professor H. Mohn, the Chief Editor
the Collection of "Selskabet for de norske Fiskeriers Fremme").

DIVISION LVII.

217. **BERGEN MUSÆUM**, Bergen. Ancient Bow and Ar
kill the whale (*Balænoptera rostratá*), also Lances and Harpoons, two knives use
and flesh, etc. On a certain part of the western coast of Norway, whales pass thr
inlet of a fjord and fail to find their way back again. When swimming aroun
whale would be observed at once, and the fishermen try to kill it by means of a
iron arrow, only five or six inches long. The mode of proceeding was to shoot
an arrow with a loose iron point up in the air in such a manner that it would
pendicularly and strike the body of the whale. Iron points, made of old ship b
rusty, would be preferred as the best for the purpose. When struck by the
would swim about for twenty-four or thirty hours, and then float up to the surfa
dead or poisoned, having a wound a foot or more in diameter around the place
had struck; the iron point itself would be found worked down to the backbone,
part. As the shaft of the arrow was loose, of wood, and marked with the own
would get detached from the iron point and float, and thus show which of th
more than one had shot, had killed the whale. After having cut out the wound
special knife, men and women from all the farms around the bay, being t
on the look out, would meet with their whale knives and cut out of t
special and long predetermined pieces, and bring them home for food. These
still in occasional use.

218. **FLADMO, T. C.**, Kristiania, Sculptor. *Awarded*—L
Bronze Medal; Stockholm, 1869, Silver Medal. Two Models of the Viking Sh
at Gokstad near Sandefjord.

219. **NICOLAYSEN, N.**, Kristiania, Antiquary. Exhibi
The Viking Ship, discovered at Gokstad in Norway, described by N. Nicolays
10 wood cuts, and 13 plates. Kristiania, 1882.

221. **VÆRING, O.**, Kristiania, Photographer. (1) Photographs of the Viking Ship found at Gokstad. (2) Photograph of the Model of same Viking Ship.

DIVISION LVIII.

222. **SELSKABET FOR DE NORSKE FISKERIERS FREMME,** Bergen (Norwegian Fisheries Improvement Association). Collection of Norway's Fishing Laws.

DIVISION LX.

223. **AARESTRUP, MISS M.**, London. Oil Painting: On the look out for the missing fishing boat.

224. **BENNETTER, J.**, Sole Stavanger, Painter. *Awarded*—Paris, Mention Honourable; Havre, Silver Medal; the Gold Medal Litteris et Artibus. Oil Paintings. (1) Seining Herrings at Seidisfjord, Iceland. (2) Bound for the fisheries off Iceland. (3) Scenery at a Fishing Station in Iceland in the Evening. (4) A Herring Curing House.

226. **BERNHOFT, ALBERT**, Bodø. Fishing on the Lofoten Fishing Grounds with Cod Gill-Nets and Lines.

227. **BØE, FRANTZ**, Bergen, Painter. *Awarded*—Paris, 1855, Mention Honourable. (1) The "Horseman" mountain in Lofoten (Midnight sun). (2) Fishermen going out for their nets at Lofoten. (3) Norwegian Salt Water Fishes. (4) Wild Ducks and their Young Ones. (5) Marine Shells and Pearls. (6) Fishermen at North Cape, Midnight Sun.

228. **BOECK, TH.**, Kristiania. Books on Fish and Fisheries.

229. **THE CENTRAL BUREAU OF STATISTICS**, Government Office, Kristiania. *Awarded*—Cordova, 1871, Silver Medal; Paris, 1875, in the International Geographical Congress, First Class Medal; Philadelphia, 1876, Medal; Berlin, 1880, Silver Medal. Statistical Tables and Reports on the Norwegian Fisheries in 1881, and for the years 1866–1881.

230. **DIETRICHSON, T. L. W.**, Molde, Master at the School of Molde. *Awarded*—Paris, 1875, Mention Honourable for a Newly Invented Bathothermometer. (1) Statistical Maps of the Norwegian Fisheries for each year from 1866–1880, in three explanatory Plates for 1866–1870, 1871–1875, and 1876–1880. (2) The Catch of the most important Fishes for each County. (3) The Exports of the most important Fish Products for each Custom House Office. (4) The Population for Norway, of each County and Town. (5) The Depth of Water on the Coast of Norway. (6) The Export of the most important Fish Products from Norway to different Countries.

231. **GRAN, MISS MARGARETHA**, Bergen. Oil Painting—Salt Water Fishes.

232. **HAALAND, LAURITZ**, Hvidingsø, Stavanger, Painter. Oil Painting—(1) Herring Fishery on the west coast of Norway. (2) Shipping Lobsters for England.

233. **HOLCK, JULIUS**, Bergen, Painter. Oil Painting—(1) Seining in a Norwegian Lake. (2) Trout Fishing in the River Holvigselven.

234. **HOLMBOE, O.**, Fredriksstad, Custom House Surveyor at Fredriksstat. *Awarded*—Berlin, 1880, Bronze Medal. A Geographic-Statistical Map of the Norwegian Fisheries showing the Export of Fish Products.

235. **JOHNSEN, HJALMAR**, Kristiania, Painter. Oil Painting—(1) Spring Herring Fishery on the West Coast of Norway. (2) Lofoten Fishing Boat in a Gale.

236. **LØVAAS, HANS**, Bergen, Painter. Oil Painting.—The Fishing Station Ona in Romsdalen, Norway.

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ARTHUR HERBERT, A.A.G., Col.

N.B.—A General Order on the subject will be issued in next month's orders.

237. **THE PRIVATE SURVEYING OFFICE, Kristiania.** (1) Statistical Maps of Norway. (2) Heliotyped Drawings of Different Ways of catching Salt Water Fish in Norway. (3) Maps relating to Norwegian Expeditions to the Arctic Sea. (4) Ditto to the Norwegian Expedition for Exploring the North Atlantic Ocean.

238. **REIN, E.,** Bergen, Painter. Oil Painting—Norwegian Boats.

239. **SARS, PROFESSOR G. O.,** Kristiania. Reports on Norwegian Fisheries.

240. **SCHJELDERUP, MISS LEIS,** Bergen, Artist. Oil Paintings—(1) A Day's Catch. (2) Fisherman's Grandmother. (3) Sleeping Fishergirl. (4) Lady Artist on the sea shore.

241. **SCHIERTZ, F. W.,** Bergen, Painter. Oil Paintings taken when Exhibitor was a Member of the Norwegian Expedition for Exploring the North Atlantic and Arctic Ocean—(1) Fishing Station in the Northern Part of Finmarken. (2) The Bay of Driftwood on the Eastern Coast of Jan Mayen Island. (3) Seal Fishermen on Drifting Ice off the Eastern Coast of Greenland. (4) A Graveyard in the North-western part of Spitzbergen.

242. **SELSKABET FOR DE NORSKE FISKERIERS FREMME,** Bergen (Norwegian Fisheries Improvement Association). Collection of Drawings and Pictures relating to the Norwegian expeditions to the Arctic Sea.

243. **SKARI, EDW.,** Kristiania, Painter. Oil Paintings. (1) Seal Fishing. (2) Whale Fishing.

244. **SØVIG, THEODOR,** Bergen, Painter. Oil Paintings. (1) Lofoten Yachts on the way to Bergen with Fish Products. (2) The Harbour of Bergen, with Fishing and Transport Vessels.

245. **THE SURVEYOR-GENERAL'S OFFICE,** Kristiania. (1) Charts of Soundings off the Coast of Norway. (2) Ditto, the Coast of Norway. (3) Ditto, some Fishing Places on the Coast of Norway.

247. **ULFSTEEN, NIC.,** Bergen, Painter. Oil Painting. (1) Fisher-coats and Fishermen at the Coast of Jæderen (Norway). (2) Sprat Fishing with dip nets.

248. **VÆRING, O.,** Kristiania. Photographs of Fisheries in Norway.

249. **WALLEM, FREDRIK M.,** Bergen. (1) Report on American Fisheries (1877). (2) Ditto on French Fisheries and Industry connected with them (1880). (3) Ditto on the International Fisheries Exhibition at Berlin, 1880 (1881). (4) Herring Fishery of Holland (1882).

250. **WENTZEL, GUSTAV.,** Kristiania, Painter. Oil Painting. Shed for Fishing Beats.

251. **WIGDAHL, A. G.,** Bergen, Painter. Oil Paintings. (1) Salmon River in Norway. (2) Trout fishing.


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# PORTUGAL.

(*For Plan, see p.* 92.)

e maritime portion of the continent of this Kingdom is divided into three Departments, ll of which fishing is more or less carried on, but it is an industry which at the present e cannot be considered as in a very flourishing condition.

There does not now exist in Portugal what is known as deep-sea fishing, that is fishing stised beyond the maritime limits, and that commonly called *coast* fishing tends to deceive, t is known that this fishery has no limits determined by the extent of the shore, and when ied on at some distance from land it is termed deep-sea fishing. We have also to deal with ing in rivers up to the point where they join the salt waters.

Both fresh and salt water fishing are divided into two large groups according to the means loyed in the capture, viz., net-fishing and fishing with lines. The first-named, undoubtedly most important, is again subdivided into two classes, fishing with fixed nets and trawling; er carried on from land or at sea within walled enclosures.

Besides the means adopted in catching the moving species, there exists what may consti- a third group, which is, however, insignificant.

At this point we will proceed to a rapid review of the manner in which the fishing stry is carried on in the three Departments and the sub-districts.

*Department of the North.*

This comprises the shore from the river Minho to the left bank of the Mondego. It con- of five districts, viz.: 1. Caminha, 2. Vianna de Castello, 3. Porto, 4. Figueira, weiro.

1. Caminha. In this district, which comprises the townships of Caminha, Villa Nova de eira, Valença, and Moncao; the industry is divided into two branches, coast fishing and fishing. On the coast are caught whiting and other coarse fish, sturgeon, and sardines; e rivers, lampreys, salmon and shad. The appliances used in coast fishing are the nets d *Volanta* (of gauze and with narrow meshes), *Zangirelho*, *Vallo*, and *Sardinheira* (for nes), for river fishing, those designated *Lampreeira* (for catching Lampreys), *Tresmalho*, nmel), and *Algerife*. Lines too are made use of, and hooks, on a smaller scale, and her net, similar to the *Vallo*, for catching young sturgeon and smaller fish. With exception of a small section of the town of Caminha, the people who carry on this stry are not fishermen properly so-called, but artizans of various kinds and labourers, only a small portion of the inhabitants keep to fishing to the exclusion of all other pursuits. season for fishing in the Minho is restricted to the months of January to June, but on the is carried on whenever circumstances are favourable. The vessels used for fishing oses at Caminha may be stated approximately at one hundred and twelve, twenty of which mployed both on the coast and river, and the remainder on the river exclusively while season lasts. In the three remaining townships the fishing boats are about equal in ber to those at Caminha.

2. Vianna de Castello. This district consists of the townships of Vianna and Ponte de a. In this district likewise the fishing industry is divided into two branches, coast fishing river fishing. On the coast are taken whiting and coarse fish, also sardines, and in the lampreys and lobsters. The mode of capture is by nets (names not given), but other ratus are used for taking lampreys. The take of this district is all consumed locally. embarkations number one hundred and six, forty being small vessels for river fishing, -four for sardine catching, and twenty-two larger ones for catching whiting. The ber of men employed may be stated at about five hundred. The industry is carried on all year round, the sardine appearing in greatest quantities from May to December, while fishing takes up the months of February, March, and April.

3. Porto. This district comprises the townships of Porto, Villa do Conde, Villa Nova de a, and Amarante. Fishery on the coast (in deep water) consists of whiting, congera, sofio

and other species; on the coast, sardines, *fanece*, soles, and smaller fish. In the river, sturgeon, shad (*savel*), *savella* (small shad), lampreys and plaice are caught.

The apparatus for deep-water fishing consists of nets called *saramonas*, *robaleiras* (for making sturgeon), *vargas-chinchas* and *chinchorros*: the three last being employed in river fishing in addition to the nets named *lampreeiras* and *feiticeiras*. There are eight hundred vessels employed in this district, 8 following deep-sea fishing from Valbom, 3 from Fureda, 1 from Avintes, 1 from Campanha; there are also 9 boats from Foz, 30 others from Matorinhos, 24 from Leçoda Palmeira, 16 from Loire, 36 from Villa de Conde, 470 from Povoa de Varzim. In coast and river fishing 200 vessels are employed, viz. 180 from Valbom and 20 from Foz. The number of the crews amounts to about 3,800 or 4,000 souls. These men do not ply their calling in Spanish waters. Deep-sea fishing is carried on all through the year, that for sturgeon in winter; sardines, *fanece*, soles, and smaller fish are caught on the coast in summer time, lampreys are taken in January and February, shad in February and March, *savelha* from May to July, and plaice at all times.

Delegation of Povoa de Varzim. At this place fishermen use for all kinds of fish, with the exception of sardines, fishing lines and hooks called *espineis* or *espinheis*. Deep-sea fishing, that is, fishing for congers and *safio* (a species of conger), is carried on by line, and that on the coast for *fanece* with a line carrying six hooks. The nets used are those named *meiro*, for all small fish as whiting, &c., and *rascas* for turbot, skate, and soles; the net called *Pescada* for rock and similar kinds; lastly, a special net for sardines There are in this Delegation 470 vessels, viz. 16 pinnaces (*lanchas*), 42 boats (*bateis*), and 344 *catraias*, which are employed at fishing in one way or another, according to the fish required and the season of the year. The pinnaces are employed nearly all the year in catching whiting; their complement is 20 men, but in the winter time employed in catching sardines either divide their crew amongst these or the smaller boats (*bateis*). The *lanchas* have a crew of from 12 to 17 men, and the *bateis* about 8 or 9. The latter are employed in catching sardines, and with the nets called *Rascas* in catching turbot, skate, and soles. The *Catraias* are only used when the weather is quite calm, and fish with the hooks called *espineis*. Their crew numbers 8 or 10, and have lines and the nets called *Rascas* worked by 4 or 5 men. Besides this, the same people are employed in catching sardines. The approximate number of men engaged in the fishery industry of this delegation is about 2,630.

4. *Aveiro.*—This district comprises the townships of Aveiro, Feira, Ovar, Angeja, Libo, Vegas, Mira, and Verga. There is no deep-sea fishing here. On the coast the industry is plied, and on the rivers and their confluents, all kinds of shell-fish being taken. The modes of capture are drag-nets on the coast, on the rivers drag-nets also, but of smaller dimensions. Besides this the shell-fish are taken with a sort of iron rake called *ancinha*. There are about forty vessels employed in the trade with twenty or twenty-five men. The crew of the vessels employed in the rivers and confluents varies according to the nets used from two to eight men, the same number mann the boats which are engaged in catching shell-fish. Fishing in this district is carried on all the year round. The fish taken are shad, *sabogas*, *tainhas*, sturgeon, *negrães*, lampreys, seals, &c.

5. *Figuiera.*—This district comprises the townships of Figueira and Lavas. The principal branch of industry in this district is the sardine fishery. On the sea whiting and other large fish are caught. The mode of capturing sardines is with shore drag-nets, and other nets (*amalhar*) are used on the sea, special nets too are employed on the rivers.

The whiting fishery is carried on solely by vessels with trawl nets, which remain in the sea for a day or more. The nets are provided with proper buoys and marks. Conger fishing is carried on with hooks and lines, and other appliances suitable for catching a variety of fish are also made use of. In the rivers, fishing is exercised by means of drag-nets (*tresmalhos* and *atalhos*), besides which are employed the *botirães* already alluded to. The fish gathered in are lampreys, shad, sturgeon, &c. Flat-bottomed boats for sardine fishing are used, with drag-nets, the boats being manned by thirty men. Flat-bottom boats too are used for river fishing, and keeled vessels manned by twenty men for whiting. The number of individuals employed cannot be determined, but may be stated as some thousands. The season for fishing is the whole year, with the exception of sardine drag-net fishing, which lasts from May to the end of January, and the other sardine fishery from October to the end of February.

*Central Department.*

is comprises the shore from the left bank of the Mindego to Cape St. Vincent, and is
into three districts, viz.: 1. Alcoboça (Sollartinho); 2. Lisbon, 3. Setubal.

*Alcoboça.*—(sea-port S. Martinho). This district includes the townships of Alcoboça
idos, and has two ports, where fishing is carried on, viz., S. Martinho (Foz do Arelho)
aia de Nazareth (Costa de Vieira).

Martinho has only about fourteen or fifteen fishermen by profession, the larger portion
ailors, who when they have no other work follow fishing, to occupy their time, in boats
own.

e fish caught here are eels (*safio*), in from 12 to 14 fathoms of water, outside the bar,
a mile N. and S. Lobster fishing is carried on outside the bar by means of traps in
fathoms of water. Shell fish are also taken outside the bar with proper utensils, and
the river, but this latter fishery is unimportant.

ere are occasions when quantities of both large and small fish of all kinds come within
its of the port, drag-nets are employed in catching these, besides small nets called
and the tackle called *espinheis*. The summer months is the time when the industry is
tive at this station. The vessels employed are small boats and canoes from ten to
tons manned by one or two hands. The market is supplied with fish coming directly
azareth.

*goa de Foz do Arelho.*—Different qualities of fish are captured here, and the utensils
are those called *algerifa*, which require four or five persons to work them. The vessels
ll boats with flat bottoms. The individuals who carry on fishing are not exclusively
en, but are engaged during the larger portion of the year in agriculture, and only follow
mer calling in winter. Every year four or five boats are enrolled, having eight or
n.

*aia da Nazareth.*—This is the most important point in the district. The methods of
on this coast are drag-nets and fixed engines for small fish, and hooks for the larger
in deep waters. The total fishing products at this port of late years has amounted to
xty to seventy million reis (this relates to the year 1878).

irty vessels are engaged here of various sizes, twenty-four being employed with drag-
d fixed engines, the remainder follow sea-fishing. The number of persons employed is
n 300. There is no restriction in the seasons except for fixed engines, which can only
from May to August; other fishing lasts all through the year.

*eira.*—The fishing industry at this port is confined to sardine catching with drag-nets.
are five barks and sixteen hands, in addition to a company of from forty to five hundred
ourers. The season lasts from July to the end of October.

*Lisbon.*—This district comprises the townships of Lisbon, Lerminha, Sobral, Peniche,
a, Cintra, Cascaes, Ociras, Betem, Olivaes, Villa Franca, Arambrija, Ateochete,
llega, Barrein, Seisal, and Almeda.

*niche.*—Branches of industry, coast and deep-sea fishing. Fish taken are sardines,
whiting, *safio*, *cherne* and others. Approximate value 37,000 milreis. Modes of capture,
es, nets called *saccadas*, *sardinheiras*, also hooks and lines. There are twelve
vessels carrying the *armações*, sixty-two smaller ones auxiliary to them, sixty
nes with the *sardinheiras*, thirty-eight large boats for catching *chicom* with the *saccadas*,
r larger fish ninety others are enrolled with crews amounting to 1550 men, besides
occasional hands. The season for sardine-catching with *armações* takes place from
y to August, and with *sardinheiras* from August to December. Deep sea-fishing goes
through the year.

*riceira.*—Coast fishing only carried on here, the fish caught are whiting and sardines;
s also are taken. Nets are used for whiting and sardines; the lobster is taken with a
aped like a sack and placed at the bottom of the sea. There are seven vessels of large
the nets employed in catching whiting, with crews of ten to eighteen; also thirty
ones employed in hook-fishing for sardines, and rod-fishing for whiting entering the sea
e river's mouth, and such as can be carried on close to the port. These have crews of
ur to eight persons. Besides these there are very small boats designated *fociuhos de*

*porco* (pig's noses), of which there are twenty, managed by two and sometimes by one person only. These are engaged in lobster catching, also try for sardines, and sometimes use hooks. This port possesses a hundred and seventy fishermen. The season for whiting (with large boats) is from July to October inclusive, and at other times whenever the weather and wind permit.

*Lisbon.*—River and coast fishing. There are, more or less, six boats (*canoes*) of small dimensions employed in line fishing on the river, and in summer, from June to August, proceed to Cascaes, Cabo Rezo, and Arta de Caperaia. The number of fishermen is twenty or thirty.

*Betem.*—About six boats, more or less, with the same number for crew, and under the same conditions as at Lisbon.

*Bom Successo.*—Three or four boats and fifteen men.

*Paço d'Arcos.*—Here are five or six boats employing twenty to thirty men. The tackle used are hooks and lines. The season is from June to August, and the calling is plied both within and beyond the promontories at a distance of three miles, and on rocky bottoms at a depth of from 30 to 40 fathoms, fishing is carried up to Cabo de Roca to a depth of 500 fathoms also on rocky bottoms.

*Cascaes.*—The branches of industry are fishing with various lines and tackle, some for whiting and other varieties of fish, others for sardines. There are a dozen boats, manned by about thirty hands, which fish under the same conditions as at Paço d'Arcos. Apparatus *armações.* In the months from March to September there are placed in the bay four or five these, which employ about twenty small boats, with 100 or 150 fishermen of different ages. The depth of water is 11 or 12 fathoms, the size of mesh in the nets is ½, 1, 3, and 6 inches (*polgedas*).

*Costa de Caparica.*—The branch of the industry here is fishing with drag nets, called *Artes.* There are on this shore twenty-four boats (*saveiros*), manned by 500 or 600 hands. Fishing is conducted at all seasons of the year, the nets being launched in from 6 to 10 fathoms of water, and have meshes of from 1¼ to 6 inches.

*Trafaria.*—Hook and line fishing and in winter nets are employed for sardines, the casting nets, mesh ½, 1, and 1¼ inches. There are fourteen or sixteen boats (*saveiros*) and twenty canoes and small boats, with about 400 or 500 people.

*Seisal.*—Branches of industry, catching sardines and other fish. These are captured with drag-nets (Tantarenhas), and in the case of sardines with trawling nets. There are four or five smacks (*moletas*), fifteen to twenty boats for the drag-nets, and over thirty employed in small fishing; the number of men being from three to four hundred. Outside the harbour the smacks and boats often trawl twelve miles to the south-east of Cabo de Roca to the coast of Capisson, at a depth of six fathoms, the meshes used are ¾, 1, 1¼ and 3 polegadas. The smacks fish in summer and in winter too when weather permits, and also enter the river. In winter the fishery is principally confined to netting sardines within the roadstead.

*Barreiro.*—Net fishing. Vessels employed, sixteen to twenty smacks and boats, and two or three trawlers. These fish all the year round on the same conditions as at Seisal. Three hundred men are employed.

*Extra hands (adventicios) at the port of Lisbon.*—In the months from December to March there come from the various ports of Algarve vessels for the purpose of catching whiting, bream, and roach. The methods of capture are nets and lines, the depth being from 200 to 300 fathoms. There also come from Setubal during the months of April and May certain strangers who pursue the whiting fishery with hook and line. From the northern ports, such as Aveiro, Porto, Ericeira there arrive between October and February some boats of those localities to catch sardines. In the Tagus they try for shad.

### *Third District—Setubal.*

This comprises the townships of Setubal, Cezimbra, Alcacer do Sol, S. Thiago de Cacem and Sines. Branches of industry, on the coast, gear (*armações*) for sardines and fish in general, *artes* and *chinchas;* in the ocean trawling nets, with smacks, &c., also lines. On the river *chinchorras* (small trawling nets), *tresmalhas, cassoara* (net for sea lamprey) traps, and wheel nets are used. In estimating the relative importance of the fisheries the first place must be assigned to that with the armação, which is valued at 6,000 milreis, then comes that with the

1,500 milreis. The fishery with hooks is likewise important, and also that for shad. :ear 1877, 154 vessels were enrolled, viz. 101 from Setubal, with crews amounting to 459 and 53 from Cezimbra with 201 hands. In 1878 there were 125 vessels with crews of . 17 *cahiques*, 51 *canoas*, 8 *bateis*, 13 *botas*, 17 *barcas*, 1 *lancha* and 18 *armações*. The ' the last named varies daily, extra hands being taken on when wanted. There are 19 *armações* on the coast of Cezimbra and from Arrabida, 9 from the coast of Galé, the coast near the bay of Sevias, and 1 from the south-east of Odemira. There arrive, ny Spanish feluccas for the purpose of buying sardines. The decline of the fishery r is attributed to the smallness of the meshes in the nets used.

:*imbra*.—Branches of industry.—Fishing for sardines, and large fish, such as whiting, &c. de of capture is by the *armações*, trawl-nets, and hook and line. There are also rod and drag net fishing, but these latter are not important. In the nineteen *armações* from this coast from the neighbourhood of Arrabida to Cabo d'Espichel there are ɔd 114 vessels manned by 700 people (a few more or less). each *armação* ordinarily ı six embarcations. To deep-sea fishing there go out forty-one vessels manned by about ls. The *artes* employ the same people as those mentioned above, but only keep them for portion of the year.

*es*.—The branches of fishing here are those for sardines and mackerel (*sarda ou cavalha*). e caught with implements called *armações á Valencianna*, of which there are three, but ı not all used every year. There are in the bay two *chinchorros*, and on the coast of three large trawl nets. There are thirty small vessels manned by thirty hands, no ıor *caloes*. Net and line fishing is carried on throughout the year; the *armações* work arch to September, the mackerel being caught during the summer. The nets are d close to the shore.

*Department of the South.*

is includes the shore from Cape St. Vincent to the river Guadiana, and is divided into tricts, viz.: 1. Lagos, 2. Villa Nova de Portimão, 3. Faro and Olhão, 4. Tavira, 5, Villa Santo Antonio.

*Lagos*.—This district comprises the townships of Lagos and Silva. The gear used of *artes de arrastar*, and *armações á Valencianna* for tunny, *Corvina* and *Sarrajão*. h caught are sardines, tunny, corvina, and sarrajão. Deep-sea fishing is very limited. fishing is carried on all through the year, but the proper time is when the shoals riz., from the beginning of October to the end of December. Tunny fishery (*de direito*) the beginning of April to the 20th of June, the other (*pesca de revez*) from the latter date ad of August. The decline of the industry is attributed here to the want of proper and also to the lack of men from the tendency these have to engage in the Spanish . In 1876 there were enrolled—1 *armação* with 53 hands, 2 *caloes* with 8, 3 *cahiques* , 10 *artes* with 77, and 8 *lanchas* with 22 hands. In 1877 the numbers were 1 *armação* hands, 1 *calo* with 4, 2 *cahiques* with 8, 10 *artes* with 100, and 12 *lanchas* with s.

*Villa Nova de Portimão*.—This comprises the townships of Portimão and Albufeira. ritime authorities state that the fishing industry shows a gradual increase on the coast province. The branches of industry are net fishing for tunny, *corvina*, *sarrajão*, and ; deep-sea fishing for whiting, seabream, *chicharro*, *dentao*, and mackerel; river for small fish; and oyster dredging. The gear used in the capture are *armações* ny, corvina, sarrajão, and sardines: *artes* for sardines and carapão; *gorazeiras*; a; lines for seabream, &c.: and traps for some other kinds of fish. Lastly, rag-nets for river fishing, and the *rastro* are in use. Light boats are attached only armação used in this district, and the crews number 174 persons. In the with *artes* 17 *calaes* and 340 men are engaged, consisting for the most part of ; enrolled (*adventicios*). For the deep sea and coast fisheries there are 77 barcas, and *lanchas*, and 3 small *cahiques*, their crews numbering 308. When the sardines n shoals the number of extra hands is much less than that cited above. The season y, *corvina*, and *sarrajão* is the months of May, June, July, August, and September. line is caught all the year round, but with most profit in August and September; in January, February, and March: the *dentão* and seabream in June, July, and

August; the *chicharro* in January. Trap fishing is in force all the year round; dredging from December to April; net fishing in the river throughout the year.

3. *Faro.*—This district comprises the townships of Faro and Olhão. The v fishery products exported to Spain and cleared from Faro was, in 1875, 209,882 milr 1876, 139,797 milreis; in 1877, 153,840 milreis. The branches of industry are tunny with *armações*, sardine fishing with *artes*, line fishing and dredging for oysters. The are captured by being driven into enclosures called *almadrabas*, sardines are caught with nets, oysters with the *rastro*, other fish with lines, &c. River fishing is carried on wi *tresmalho* and various other nets. There exists in this district an establishment fo preparation of oysters, and which exports them to Paris in boxes of 100 and 200 tins. t or eight boats, manned by 60 or 70 people, are employed in oyster dredging. The vess the list are—1 *cahique*, 11 *barcas*, 40 *lanchas*, 1 *saveiro*, 12 *botes*, and 2 *calões*. The 4 *artes* for sardine catching, 3 *armações* for tunny. The number of persons employed is

Olhão, delegation of Faro. The people of this district is beyond doubt the most indu of the coast of Algarve, applying themselves throughout the year to one or other branch industry. The branches here are *artes* for sardines, *armações* for tunny and *corvina*; de fishing, which is divided into groups for the several kinds of fish, is carried on at various such as Charnal, Fourdinhas, &c.

The catching of mackerel (*avalha* and *sarda*) and the *sarrajão* is carried on at L and that of Janeiro to the neighbourhood of the port of Lisbon. There are besides fish various kinds on the coasts and rivers, viz., that with the *tresmalho*, *tapa esteiros*, n *choqueiroz*, *marisqueiros*, and several other sorts of fishing implements.

The most important of these industries is sardine fishing, then that for tunny, aft that for *coiro*, whiting, *sarrajão* and mackerel, shell-fish, and lastly that for miscellaneo The methods of capture are *armações* or *almadrabas*, each of the former employing ele barcations for working the gear and the transport of fish, with structures for the st material and the shelter of people. In this district there exists only one, an *armação*

The *artes* for sardines have each a *calão* and a batel and small boats (*lanchas*) for the t of fish. The gear used are known by the names of *espineis*, *tullas*, gorazeiras, pa *arqueiras*. The *linhas* are small nets used for the implements known as *tresmalhos* *esteiros*. Besides these many other appliances are in use. Oysters too are caught neighbourhood and are exported.

The destination of the fish sold is in the case of tunny, Olhão Tavira, and Villa Re Antonio, also Spain (after being prepared and salted here), Oran, and Brazil.

The sardine is sold to Spanish vessels trading at this port, and also goes to sou ports at the north of the kingdom as well as to some of the Mediterranean ports, notal much too is consumed in the provinces and at Alemtejo. When the supply is abun are salted and compressed. The *couro* is also prepared here by drying: the commerc together with the *leitão*, are important, as the value of the exports amount to a co sum. The *sarrajão* is sold on the spot to Spaniards. Mackerel are prepared on the ve nearly all go to Lisbon. Whiting are generally sold for Spain, the fishermen coming fr and carrying them away in Spanish vessels. Other fish are consumed in the prov at Alemtejo. Shell-fish are mostly exported to Spain. Oysters go to Gibraltar and als

The number of vessels engaged in the industry cannot be accurately stated, since boats are employed in more branches than one. The total number of vessels enrolle was 106 at Olhão, 49 at Ferrata, with *artes* belonging to Olhão. In the *espinel* fishe are employed 15 *lanchas*, and *canoas* in the *larache*, 20 *cahiques*, 12 *canoas* and 1 *la* Olhão, with 8 *cahiques* and 6 canoas from Ferrata. The number of vessels in the fi whiting, varies according to the greater or less abundance of the fish: the vessels u *lanchas* and *canoas* only. The *Janeiro* fishery, which lasts from January to Easter, o *cahiques* from Olhão, and 10 from Ferrati: it is pursued all along the Portuguese coa duce being carried for sale to Lisbon, Cezimbra and Setubal. The population enrol these vessels numbers 923, made up of 628 from Olhão, and 295 from Ferrata. The tunny *de direito* is from the end of April to June, that *de revez* from the end of June of August. The sardine is caught all the year, but with most profit from August to J

*Coiro* are caught from April to October, and whiting all the year with the gear

and with *linhas* from October to March. The Larache fishing for the *sarrajão* is from to the end of June, and that for mackerel from May to September. The Janeiro fishing iiting, roach, swordfish, &c., lasts from the end of December to Easter; shell-fish are from September to April, the remaining species all the year round.

*Tavira.*—This district consists of the township of Tavira. The branches of the industry t-fishing and fishing with hooks. The gear used are *armações* or *almadrabas*, for tunny, ets for sardines, and hand nets for smaller fish. Hooks and lines are also used. In the and lakes, lines are used, together with hand nets and the *candeio*. The most important e methods are the *armações* and the *artes de chovega*. The vessels number 7 employed transport of fish (*andainas*), 13 *artes de chovega*, 15 *barcas*, employed like the first named, *cu*, 2 *lanchas*, 19 *botes*, and 4 *armações*. There are on the average 330 persons employed fishing and on the smaller vessels, and 300 on the *armações*, but on exceptional occasions persons from inland come to help the fisheries. These latter proceed with the fishing *de* from April to June, and with that *de revez* from June to the beginning of August. ther appliances work during the year at the most suitable stations. The season for es is from October to December, *vezago* and whiting are taken throughout the year, the ish in December, January, and February, the roach and *dentão* in August and Septem- The produce of this fishery is sold in Portugal and Spain.

Villa Real de Sto. Antonio. This district comprises the townships of Villa Real, im, and Martola. The branches are net fishing and line fishing. The means of capture *rcas* or *chovegas* (arte) galeãs or circular net, the nets called *Crada*, *solheira*, *tresmalho*, *pa esteiros*, the *palangre* and lines. The *chovega* or *arte* and the *galeão* are used for es, and lines for the various qualities of fish, and *tapa esteiro* for the tainha. The sardine is the most important in this district, in the month of October 1877, there were sold in Real, 27,000 milreis' worth of this fish. The vessels number 1 *galeão* (now 2), 27 *barcas* , 56 coasters for carrying fish, 4 *lavadas*, 6 *solheiras*, and 2 *tresmalhas*. There are about persons employed regularly, and besides these some 200 outsiders, principally women and en, who work as extra hands. The total number of seamen enrolled is 1386, but some of are employed in navigation. The time for catching *corvina* is from March to the end of and that for sardines from September to January, when they most abound. The fourth and Districts of this Department have been worked since the convention with Spain by Spanish s, of which some 20 or more come here to fish during the sardine season, which is not to terest of our fishermen.

OTE.—At Lagos, Portimão, Foz, Olhão, Tovira and Villa Real, there are societies for the t of fishermen, these were formerly of great help to them, but now, owing to abuses, the es are in a state of decay and have little importance.

ISBON, 11 *April*, 1883.

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**OSSERVATORIO DO INFANTE DON LUIS**, Lisbon. (1) explanatory of the Storm Warning System in use in Portugal. (2) Specimen of Daily her Report.

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# RUSSIA.

(*For Plan, see p.* 338.)

[*Up to the time of going to press with the Second Edition, the Official Introduction to the Exhibits from Russia had not been received.*]

## CLASS I.

1. **ARCHANGEL STATISTICAL COMMITTEE.** (1) Models of Vessels used at the Cod Fisheries, for Walrus Hunting, and on the Moorman coast. (2) Models of Nets used for the capture of *Delphinopterus Leucas*, Herring, Salmon, *Gadus Navaga*, *Coregonus*, and other fish. (3) Long Lines and Hand Lines for cod and other fish. (4) Harpoon Spear for killing the Walrus and *Delphinopterus Leucas*.

2. **DEMIDOFF, J.**, Ostashkoff. (1) Hemp used in the manufacture of nets. (2) Flax Nets, Fyke Nets, for small and large fish. (3) Spike used to break the ice.

3. **ENIKEEFF, PRINCE N.**, Novgorod. Models of Buck and Fyke Net.

4. **GOTCHKA, T.**, Novgorod. Nets for Freshwater Fishing.

5. **GOOSTOFF, A.**, Besvodnoie, Nijni-Novgorod. (1) Collection of Hooks for sturgeon fishing, in the rivers and at sea, sterlet, pike fishing. (2) Lines for perch and other fish.

6. **IVANOFF, A.**, Ostashkoff. (1) Fyke Nets. (2) Trammel Net.

7. **HOTH, J.**, St. Petersburg. Tarred and White Cordage Lines, Whaling and Fishing Lines, Driving Ropes, Oakum. The cordage and lines are manufactured by machinery and by hand.

8. **KARPOFF, P.**, St. Petersburg. Fyke Nets for *coregonus* and perch fishing in the Neva Bucks for the capture of Lamprey.

9. **KAZAKOFF, C.**, Archangel. Fishing Lines.

10. **STATE'S DOMAINS MINISTERIUM.** (1) Collection of Illustrations of Different Modes of Fishing used in Russia. (2) Collection of Models of Nets and Lines used in the Volga and Caspian Sea.

11. **NOSSOFF, A.**, Besvodnoie, Nijni Novgorod. (1) Collection of Hooks used for sturgeon fishing and for the capture of small fish. (2) Long Lines for the same.

12. **RENFORS, H.**, Finland. (1) Flies for trout, grayling, salmon. (2) Spoon Baits.

13. **SAPOJNIKOFF, BROTHERS**, Astrachan. Seine Net, 2000 ft. long, used in the mouth of the Volga, in the Spring-time.

14. **SOKOLOFF, D.**, Bakoo. (1) Nets for the capture of *Alburnus chalcoides* and other fish. (2) Models of Fishing Boats and Vessels.

15. **GIRDWOYN, M.**, Warsaw. Apparatus used for catching fish in Poland:—(1) Ordinary Salmon Line. (2) Line with Spoon-bait. (3) Arrangement of Lines for catching eel, called "Motovenz." (4) Net called "Benbenek." (5) Net for catching fish in rivers, called "Wencierz" or "Skrzydlak." (6) Model of Net for river fishing. (7, 8, 9) Plan of a Boat, used for lake fishing. (10, 11) Plan of a Boat, used for pond fishing. (12) Pamphlet, "Fishing Boats for our Lakes and Ponds," explaining the above methods.

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## Class II.

16. **IVANOFF, A.,** Ostashkoff. Personal equipment of fishermen of the terior of Russia.

17. **PLATONOFF, B.,** Astrachan. Personal equipment of fishermen o: e Volga.

## Class III.

18. **ADJEMOFF, ARUTIN,** St. Petersburg. Isinglass from sturgeon, erlet, *Silurus Glanis* (sly or sheat fish),—from Caspian and Azov seas, and Volga, Oura beria.

19. **ARCHANGEL STATISTICAL COMMITTEE.** (1) Tusks of 'alrus and articles manufactured from these tusks. (2) Fresh Water Pearls.

20. **ADMINISTRATION OF STATE'S DOMAINS IN ASTRA-HAN.** (1) Collection of Samples of Salt for Fish curing. (2) Map of Salt Lakes an its and Fish-Curing Establishments of Astrachan.

21. **ALESHKY,** Taurida. Crayfish Tails, dried; the Crayfish are caugh the mouth of the Dneiper.

22. **ALIBEKOFF, A.,** and **NAZARBEKOFF,** Bakoo. (1) Caviare ir n boxes. (2) Dried cartilaginous dorsal chords (Vezeega). (3) *Alburnus chalcoides* smoked (4) *Leuciscus Frisei*, smoked.

23. **BETTE, P.,** Reval. Preserved *Maletta vulgaris.*

24. **ARCHANGEL STATISTICAL COMMITTEE.** (1) Codfish Oil (2) Seal Oil.

25. **HUTCHINSON KOHL AND CO.,** S. Francisco. Seal Skin rom Komandorsky Island.

26. **ERMOLAEFF, E.,** St. Petersburg. Model of Fish Shop on a barge s used in the canals and rivers in St. Petersburg.

27. **HLEBNIKOFF BROTHERS,** Astrachan. (1) Salted Herrings (2) Caviare from Sturgeon, *Lucioperca Sandra* (Perch-pike), *Abramis Brama* (Carp-bream) (3) Plan of a mill for fish-curing salt.

28. **HVASTOUSHIN, N.,** St. Petersburg. Seal Oil.

29. **GRUENVALDT, P.,** St. Petersburg. Amphibious mammalia skins eal, white bear, fur dresses, and other articles.

30. **JLIIN, N.,** Astrachan. (1) Caviare of *Lucioperca Sandra* (Perch-pike) *Abramis Brama* (Carp-bream), pike. (2) Salted and dried backs of sturgeon.

31. **KALASHNIKOFF, S.,** Tchernoyar. Lamprey Oil (*Petromyzo Wagneri*).

32. **LINDER, BARON F.,** Finland. Freshwater Pearl Shells and Pearls

33. **LOPATIN, J.,** Tchernoyar. Lamprey Oil and Cured Lamprey.

34. **MALAKHOFF,** Reval. Tinned Preserved *Maletta vulgaris.*

35. **MASLOFF, M.,** Kalooga. (1) Herring, marinated. (2) Herring i il. (3) Dried cartilaginous dorsal chords (Vezeega).

36. **MEYSNER AND SAPOJNIKOFF,** Astrachan. Barrels manu factured from Linden Wood, Oak, Asp, for Herring.

37. **MERRECUL, M.,** Reval. Preserved *Maletta vulgaris.*

38. **STATE'S DOMAINS MINISTERIUM.** (1) Collection of stuffe specimens of the commercial Russian fish. (2) Chemical analyses of the most importar Russian fish and fish products, by Prof. Kostytcheff.

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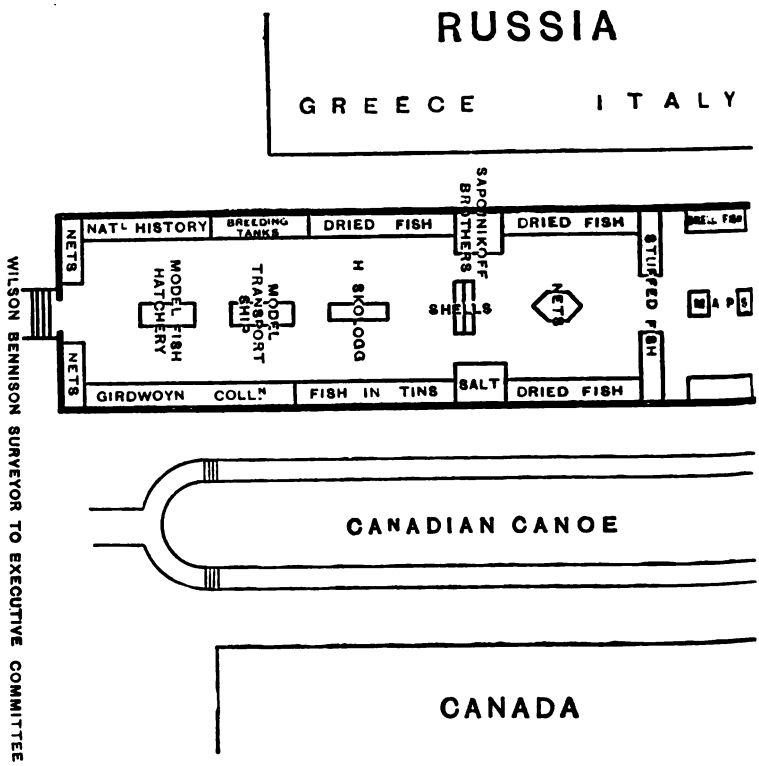


39. **PITOÏEFF, T., PRIDONOFF, G., MONTASCHEFF, A.**, Baku. (1) Caviare and Isinglass from Sturgeon. (2) Dried cartilaginous dorsal chords (Vezeega). (3) *Alburnus chalcoides* smoked. (4) *Acipenser stellatus* salted.

40. **PROOSSOFF BROTHERS**, St. Petersburg. Tinned Sturgeon, Sterlet, Sig, Trout, Coregonus, Smelt.

41. **ROMAN, J.**, St. Petersburg. Tinned Sturgeon, Salmon, Smelt, Lamprey, Anchovies.

42. **ROMAN, M.**, St. Petersburg. Preserved *Maletta vulgaris*.

43. **SABOOROFF, M.**, Tchernoyar. (1) Lamprey Oil. (2) Mullet. (3) Smoked Herring. (4) Caviare of *Mugil cephalus*.

44. **SADOVNIKOFF, J.**, Novgorod. Plans of Boats for the transport of live fish.

45. **SAPOJNIKOFF, BROTHERS**, Astrachan. Model of fish-curing establishment.

46. **SEBECK, J.**, Petersburg. Cod-fish Oil.

47. **SEMENOFF, TH.**, St. Petersburg. (1) Sturgeon Caviare of 1882-1883. (2) Fresh Caviare. (3) Cured Sturgeon. (4) Cured and dried backs of *Coregonus*.

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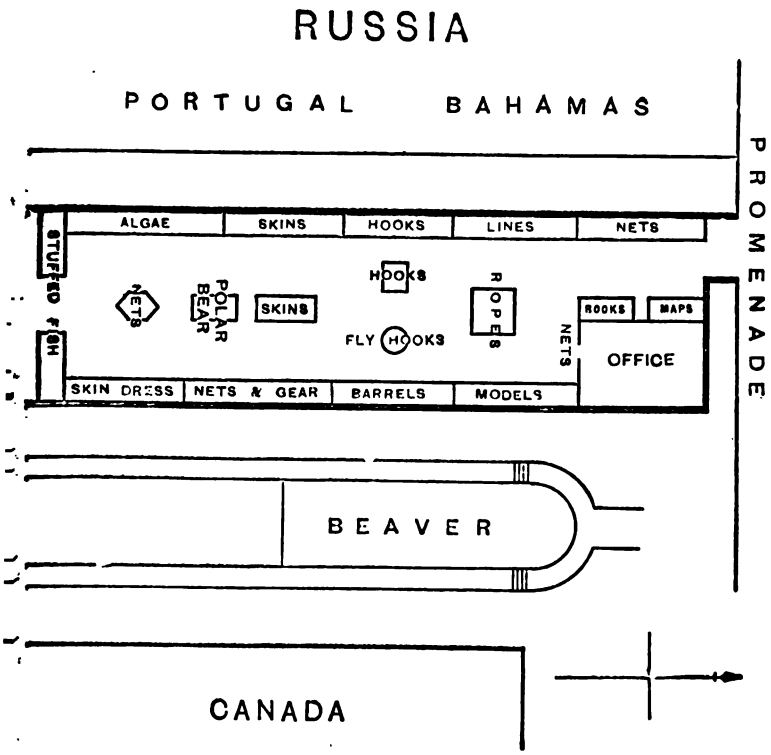


*Leucichtys.* (5) Dried: Cod-fish, (6) *Lucioperca Sandra*, (7) *Osmerus Spirinchus*, smaller variety of the smelt. (8) Smoked: Coregonus, (9) *Osmerus eperlanus*, (10) *Alburnus Chalcoides.* (11) Isinglass from Sturgeon. (12) Dried Cartilaginous Dorsal Chords (Veezega) (13) Live Sterlets from the North Dvina.

48. **SOKOLOFF, N.**, St. Petersburg. (1) Isinglass from Sturgeon, Sterlet, Silurus glanis, Cyprinus Carpio. (2) Smoked: *Alburnus Chalcoides.* (3) Herring from the Caspian and Black Seas, (4) Salmon, (5) *Coregonus.* (6) Cured Sturgeon. (7) Dried: Cod-fish, (8) *Lucioperca Sandra*, (9) *Osmerus Spirinchus.* (10) Cured and Dried backs of *Coregonus Leucichtys*, and Sturgeon. (11) Caviare of Sturgeon preserved. (12) Ditto fresh. (13) Caviare of *Coregonus.* (14) Dried Cartilaginous Dorsal Chords (Vezeega).

49. **SOORGOONOFF, J.**, Bakoo. (1) Caviare. (2) Isinglass. (3) Dried Cartilaginous Dorsal Chords (Vezeega).

50. **SHTCHEGOLEFF, P.**, Ostashkoff. (1) Dried *Osmerus Eperlanus* from lakes Ladoga and Onega. (2) Dried *Osmerus Spirinchus* from the lake Seliger.

51. **PITOIEFF, N.**, Borovitchi. Fresh-water Pearl Shells.

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52. **VLASSOFF, B.,** Gdow. Model of Steam Vessel for the transport of live fish from Astrachan to Petersburg.

53. **VENDT, C.,** Novossil. Ropes and Lines.

53*a*. **NITHAMMER & CO.,** Moscow. Soap manufactured from Lamprey Oil.

CLASS IV.

54. **ALEXANDROFF, G.,** St. Petersburg. (1) Collection of hatched trout, *Coregonus* and other fish, preserved in spirits. (2) Live salmon fry. (3) Apparatus for hatching fish. (4) Tank for the transport of fry.

55. **THE PISCICULTURAL ESTABLISHMENT AT NIKOLSKY,** Novgorod. (1) Model of the establishment. (2) Tank for the transport of live fish and fry. (3) Live sterlet.

56. **GRIMM, Dr. OSCAR,** St. Petersburg. Tank for transporting the impregnated ova of different species of sturgeon.

57. **MOOSHINSKI, C.,** St. Petersburg. (1) Hatched *Coregonus Baeri* preserved in spirits. (2) Tank for the transport of fry. (3) Live fry of *Coregonus Baeri*, trout fry.

58. **OVSIANIKOFF, Ph. Dr.,** St. Petersburg. (1) Wax casts illustrating the development of *Coregonus*, sterlet and lamprey. (2) Hatched sterlet preserved in spirits.

59. **PELTSAM, EM,** Kazan. Fish ova in different stages of development.

60. **GIRDWOYN, M.,** Warsaw. Arrangements for fish-hatching and breeding, invented by Michael Girdwoyn (13). Pamphlet explaining the above (14). Plan of the Fisheries Museum at Warsaw (15). Pamphlet explaining the above (16). Plan of artificial fish-culture in ponds on the estate of Zloty Potok (17–22). Pamphlet explaining the above (23). Plan of the lake-fishery establishment in the estate of Dukny (24–28). Pamphlet explaining the above (29). Plan of part of the fishery establishment in the estates of Antonosz and Cytowiany, embracing only the lake Sortis (30). Plan of part of the establishment for artificial fish-culture in ponds in the estate of Konopnica near Lublin (31, 32). Pathological and embryological collection of salmonoids (33). Diagrams of the above (34–44). Explanation of the diagrams (45, 46). Diagram explaining the fecundation of the eggs of the common salmon (47). The work on the pathology of fish in Polish (48). The same work in French (49).

CLASS V.

61. **GOBY, CHR., Dr.,** St. Petersburg. Russian and sea freshwater weeds.

62. **GRIMM, OSCAR, Dr.,** St. Petersburg. (1) Specimens from a collection of the invertebrate animals (in spirits) on the Caspian Sea, taken by dredging during two voyages on the schooners *Chirinetz* (1874) and *Persianin* (1876). (2) Map illustrating the course of above said schooners. (3) The Caspian Sea and its fauna, by Dr. O. Grimm.

63. **STATE'S DOMAINS MINISTERIUM.** Maps illustrating the geographical distribution of fish and aquatic animals in Russia, by Dr. O. Grimm.

64. **SCHMIDT, Ch. Dr.,** Dorpat. Chemical analyses of river, lake, and sea water.

65. **SOKOLOFF, D.,** Bakoo. Maps of the fisheries in the lower parts of the Volga and Koora and Caspian Sea.

66. **SUNDMAN, G.,** Finland. The Fish of Finland, illustrated and coloured.

67. **GIRDWOYN, M.,** Warsaw. Collection of parasites and animals injurious to fish:—Rakolec (*Lernecocera ukraimensis*), taken from the *Carassius vulgaris* (50). Ditto from the scales of the above (51). Ditto found in part of the body of the above (52). Ascaris mucronata, taken from the abdominal cavity of *Lota fluviatilis* (53). *Piscicola geometra* taken from the *Cyprinus carpio* (54). Ditto taken from the *Gadus merrhua* (55). *Gasterosteus pungitius* filled with the parasite *Schistocephalus dimorphus* (56, 57). *Schistocephalus dimorphus* from the *Gasterosteus pungitius* (58). *Osmerus eperlanus* attacked by the parasite Bonblik (59, 60). *Gasterosteus aculeatus* filled with *Schistocephalus dimorphus* (61, 62). *Schistocephalus* taken from the *Gasterosteus aculeatus* (63). *Alburnus lucidus* filled with *Ligulla diagramma* (64). *Ligula diagramma* taken from the *Alburnus lucidus* (65). Piscicola from the lake of Pizedswit (66). Bonblik taken from the Osmerus eperlanus (67). Dytiscid larve attacking a fish (68). Nepa cinerea attacking a fish (69). A fish bug from the Gasterosteus aculeatus (70). Diagrams representing fish parasites (71–74). Pamphlet on

"The parasites of our Fish" (75). *Crustacea.*—Astacus fluviatilis (polonicus) (76). Astacus fluviatilis (vulgaris) (77). Crangon vulgaris (78). Gammarus pulex (79). *Mollusca.*—Anodonta anatina (80). Unio pictorum (vilnoviensis) (81). Pamphlet on the breeding of the common salmon and on the marking of salmon in England (82).

## CLASS VI.

68. **GRIMM, OSCAR, Dr.**, St. Petersburg. Books on fisheries and pisciculture in Russia, by exhibitor and other authors.

69. **SCHULTZ, A.**, St. Petersburg. Books on fisheries and seal-hunting.

70. **SOKOLOFF, D.**, Bakoo. Articles on fisheries.

71. **VAKOOLOWSKY, N.**, Cronstadt. Article in the review "Priroda" ("Nature").

# SPAIN.

(*For Plan, see p.* 346.)

THERE do not exist in Spain any deep-sea fisheries, properly so called, involving the despatch of large fleets at certain periods of the year, and to certain points either at sea or on the coasts of savage or uninhabited lands, as it is known was the case when this country was possessed, or shared with other nations, the dominion of the seas. Since those palmy days, when, as in the reign of Philip II., two hundred vessels, with no less than [illegible] sailors, left the Cantabrian shore for the cod fisheries of Newfoundland, these expeditions have been constantly declining, and have ceased altogether. However, though in a different way, and resting on ancient rights of dominion, deep-sea fishery is coming to life again in this country, as is evidenced by the Canary Islands, on the West Coast of Africa. There a company has been formed, called the "Canario Africana," which is working the principal shoals on an extensive scale, and establishing factories on the island of Graciosa in that archipelago. With this exception, and without taking into account our important colonial fisheries, of which, owing to pressure of time in preparing this catalogue, it has not been possible to procure data, the fisheries as carried on in Spain are limited to what is technically known as coast fishing. Nevertheless it should be observed that, on the ocean coasts, this description of fishery, both in respect of the number and tonnage of the craft, and the distance they go from the shore at certain points, is, in a way, as important as deep-sea fishing is in certain other maritime countries. In the Gulf of Gascony there are steamers that go out about fifty or sixty miles off the coast to compete with the French in working certain shoals, using a fishing instrument called "bou" by the Spaniards and "chalut" by the French, both showing but little wisdom in thus using this trawling apparatus, which will end by destroying the fish which are usually to be found on the shores of this gulf in both countries. On the Cantabrian coast sailing boats and row boats go out to the same distance, although it is impossible to define the existence of shoals properly speaking, because, what with the species of fish native to the shores, and the migratory fish, the whole coast may be said to yield a large produce, but not to the same degree as the adjoining coast at the Punta de Estaca, where, owing to the numerous rivulets and streams, and the large quantity of vegetable and animal matter which they bring with them, attracting various species of fish, the entire coast of Galicia may be described as one continuous shoal, of which these channels are the spawning grounds and principal centres. At the mouth of the Miño ends the first fishery division of the North and North West, which covers an extent of 1567 kilometres, and at the mouth of the Guadiana begins the second zone or division, which terminates at the Campo de Gibraltar, extending over 204 kilometres. This second zone, though smaller, is not inferior in its yield of fish, as is proved by the fact that an important establishment (in the island of Christina) has sprung up in a few years. There also rivers and streams, flowing through fertile regions, provide abundant nourishment for the fish, which breed and migrate, and there likewise some steamers trawl with the tackle known as "bou" up to the African coast, competing with the sailing craft in the shallow waters of this region, which is the entrance to the Mediterranean. All the sea coast, between the Campo de Gibraltar and the French coast, extending over 1,149 kilometres, forms the third zone, the poorest in fish produce, although nature points to the contrary, as in every respect this sea possesses greater advantages for the breeding of fish than the European or Atlantic Ocean. The explanation of this enigma is already familiar to the more important nations which share these waters; it is undoubtedly the absurd manner in which these fisheries are worked, or rather overworked; and although this may not perhaps be the proper place to do so, we cannot resist availing ourselves of the opportunity of pointing out to the various nations interested, the [illegible]diency of convening a congress to discuss this matter, which it will soon be impossible

to deal with efficaciously, as all maritime nations are now sadly misusing the lavish natural gifts of the ocean to the various countries along its shores. The Government aid to the fishing industry is limited to encouraging initiative by publishing the works of those who distinguish themselves in foreign countries, granting honorary rewards to those who in any way contribute towards proficiency in this line, creating a model establishment for the propagation of oysters and for pisciculture, for which the State provides accommodation gratuitously, and relieving fishermen from taxes in the exercise of their calling. There are some co-operative societies of fishermen. The fishery products on the coasts of Spain for the year 1882 are estimated at 79,540,165 kilogrammes, the number of men employed was 59,974, and of boats 14,202, with a tonnage of 51,397. There are fifty private establishments, which produced in the same year 7,591,198 kilos, and employed 1,430 men, and 297 boats, with a tonnage of 2,100. There are forty-three other establishments for the cultivation of oysters and other shell fish, and for pisciculture; but as they are in a primitive state, the produce is limited. There are 535 establishments for salting and preserving, which produced this year 26,370,612 kilogrammes of fish, and employed 12,313 hands,—men, women, and children.

Exports for 1882.—Fresh fish, 533,665 kilos, of which 106,733 for Algeria, France, and Portugal. Salted, 545,031 kilos, representing 218,011 pesetas, for Algeria, Germany, France, England, Italy, Cuba, and the River Plate. Cured fish, 63,918 kilos, representing 51,134 pesetas, for Portugal, Brazil, and the River Plate. Salted and pressed sardines, 3,300,064 kilos, representing 1,650,034 pesetas, for Germany, Algeria, France, England, Italy, Portugal, Cuba, Puerto Rico, Brazil, Columbia, the United States, Mexico, Peru, Uruguay, Venezuela, the Philippine Islands, and British Possessions in China. Shell fish, 167,653 kilos, value 50,296 pesetas, for Algeria, France, Portugal, and River Plate. The most important export is that of preserved fish, but as in the Customs Returns it is classed with other preserved alimentary products, it is not possible to furnish reliable data in this respect.

TABLE *showing the weight and value of fish exported from Spain during the year* 1882, *with the countries of destination.*

Fresh Fish.

| Country to which sent. | Quantity. | Value. |
|---|---|---|
| | Kilogrammes. | Pesetas. |
| Algeria .. .. .. .. .. | 1,600 | 320 |
| France .. .. .. .. .. | 209,310 | 41,860 |
| Portugal .. .. .. .. .. | 322,755 | 64,551 |
| Total .. .. .. | 533,665 | 106,733 |

TABLES *showing the weight and value of fish exported from Spain during the year* 1882, *with the countries of destination.*

Pickled Fish.

| Country to which sent. | Quantity. | Value. |
|---|---|---|
| | Kilogrammes. | Pesetas. |
| Algeria .. .. .. .. .. | 20,260 | 8,104 |
| Argentine Confederation .. .. | 506 | 202 |
| Cuba .. .. .. .. .. | 3,353 | 1,341 |
| England .. .. .. .. .. | 96,800 | 38,720 |
| France .. .. .. .. .. | 8,481 | 3,392 |
| Germany .. .. .. .. .. | 420 | 168 |
| Total .. .. .. | 545,031 | 218,011 |

### Cured Fish.

| Country to which sent. | Quantity. | Value. |
|---|---|---|
| | Kilogrammes. | Pesetas. |
| Argentine Confederation .. .. .. | 5,372 | 4,217 |
| Brazil .. .. .. .. .. | 462 | 370 |
| Portugal .. .. .. .. .. | 58,084 | 46,467 |
| Total .. .. .. | 63,918 | 51,134 |

### Sardines, Salted and Pressed.

| Country to which sent. | Quantity. | Value. |
|---|---|---|
| | Kilogrammes. | Pesetas. |
| Algeria .. .. .. .. .. | 182,062 | 91,031 |
| Argentine Confederation .. .. .. | 3,510 | 1,756 |
| Brazil .. .. .. .. .. | 7,014 | 3,507 |
| British Possessions in Asia .. .. | 1,080 | 540 |
| Colombia .. .. .. .. .. | 106 | 53 |
| Cuba .. .. .. .. .. | 258,172 | 129,086 |
| England .. .. .. .. .. | 73,750 | 36,875 |
| France .. .. .. .. .. | 2,372,194 | 1,186,097 |
| Germany .. .. .. .. .. | 3,745 | 1,873 |
| Italy .. .. .. .. .. | 308,420 | 154,210 |
| Mexico .. .. .. .. .. | 1,697 | 849 |
| Peru .. .. .. .. .. | 18 | 9 |
| Philippine Islands .. .. .. | 1,717 | 859 |
| Porto Rico .. .. .. .. . | 21,511 | 10,755 |
| Portugal .. .. .. .. .. | 44,293 | 22,147 |
| United States .. .. .. .. | 516 | 258 |
| Uruguay .. .. .. .. .. | 18,050 | 9,025 |
| Venezuela .. .. .. .. .. | 2,209 | 1,104 |
| Total .. .. .. | 3,300,064 | 1,650,034 |

[redacted]

DIVISION I.

**NAVAL MUSEUM**, Madrid. (1) Drag Net, wide mesh. (2) Drag close mesh. (3) Drag Net, "Mar Menor" (Inland Sea). (4) Drag Net used in Cariño icia). (5) Two Drag Nets, "Grao de Valencia." (6) Specimen of Drag Net, "Terraria." Specimen of Material of Net. (8) Specimen of Drag Net "Casaret." (9) Specimen rag Net "Endecha." (10) Model of "Gola." (11) Pattern of Mesh called "Arto." (12) rn of Mesh called "Tela." (13) Pattern of Mesh called "Gambera." (14) Pattern of called "Tarralla." (15) Pattern of Mesh called "Tiro de Hondura." (16) Pattern of called "Ter de Fondo." (17) Pattern of Mesh called "Terraria." (18) Pattern of Mesh l "Arto." (19) Pattern of Mesh called "Banda de Fila." (20) Pattern of Trammel for e, from Aguadilla (Puerto-Rico). (21) Pattern of Trammel for Turtle, from "Cariño." (22) rn of Trammel for Turtle, from Carthagena. (23) Pattern of Trammel of Guadalquivir he Shad. (24) Pattern of Trammel for Pike. (25) Pattern of Trammel for "Cordallo." Pattern of Trammel for Shad. (27) Pattern of Mesh of Trammel, Valencia. (28) Pattern et Line. (29) "Llampuera" Net for fishing "Llampua." (30) Model of Net called co Real" for Sardines. (31) Portion of Mesh "Cerco Real," natural size. (32) Sample rag Net called "Traiña." (33) "Tribuquete" Net for fishing Sardines, natural size. Pattern of the Net used in the "Traiña." (35) Samples of Tackle known as "Jeito," ardines with accessories. (36) Sample of Sardine Net, wide Mesh. (37) Sample of ne Net, close Mesh. (38) Sample of Mesh for Sardine Net called second "Boguera." Tackle known as "Sardinal," Valencia. (40) Tackle known as Sardinal Carthagene. Three Models of Drag Net called "Bou." (42) Pattern of Meshes of "Bou" Net, natural (43) Pattern of Meshes of "Fisca," used in the "Bou." (44) Pattern of Meshes of queta," used in the "Bou." (45) Pattern of Meshes of "Fiscot," used in the "Bou." Pattern of Meshes of "Gualero," used in the "Bou." (47) Pattern of Meshes of dela," used in the "Bou." (48) Pattern of Meshes of "Corona," used in the "Bou." Tackle "Bolante," used in the estuaries of Galicia for Cod fishing. (50) "Angarello" used in the estuaries of Galicia for fishing cod, turbot, lobster, bream, &c. (51) ramallo," Special Net of Cariño (Galicia). (52) "Rapeta" Drag Net used in estuaries ed-mullet, sole, &c. (53) Tackle "Aljarife," natural size used in Seville for fishing since the Moorish time. (54) "Atajo" (natural size), from Guadalquivir, used for the kind of fishing. (55) "Corredera Fija" for catching shad in the Guadalquivir (Model). Model of "Almadraba de Monte Leva," for tunny fishery in the Mediterranean. (57) el of "Almadrabilla" or "Lisera" for red-mullet, soles, &c., in the Mediterranean. (58) lo" or "Velo," hand net. (59) Agugera" for fishing needle-fish. (60) "Boguera lera" for fishing ox-eyed cockarel. (61) "Atunario" for tunny fishery. (62) "Tarraya" ishing mullet from the shore. (63) Samples of nets used by fishermen of the delta of Ebro river. (64, 65) Two Models of apparatus for coral fishing. (66) "Palangre" kle called "Los enemigos," Valencia, for small fish. (67) Three "Palangre" Tackles d "Penchat," Valencia, for small fish. (68) "Palangre" tackle for fishing "Reis." "Palangre" tackle for "Corbina" (kind of conger). (70) "Palangre" tackle for red bream and lobster. (71) "Palangre" tackle for rocking fishing. (72) "Palangre" tackle Bestina." (73) "Palangre" tackle for fishing eels in the Guadalquivir. (74) "Palangre" le for "Besugo" (fish of the bream kind) and "Chicharro." (75) "Palangre" tackle for igote" and "Ollomol," kind of bream. (76) Six cords called "Brasolados," used for langre" tackle in Mataró (Barcelona). (77) Sixteen kinds of fish-hooks. (78) Appa- s for fishing "Pulpo" (kind of cuttle-fish). (79) Five classes of tackles called "Volan- s." (80) Two punchers for extracting the air from the fishes (used in Cuba) (81) teen specimens of tackle called "Volantine" of various kinds. (82) Three "Croques" atching fish. (83) Three "Croques" for "Poteras" for calamaries. (84) Eight Tackles d "Curricanes" for "Bonito" (kind of tunny). (85) Pompions used as buoys for the le called "Palangre" in Galicia. (86) Buoys of cork for the tackle called "Palangre" alencia. (87) Buoys of cork for tackle "Xeito" Vigo. (88) Birch bark for buoys, . (89) Lead weights for net lines, Vigo. (90) Lead weights for net lines, Laredo. Weights of clay, Laredo. (92) Weights of stone, Caramiñal. (93) "Orcera" apparatus raising the Xeito. (94) Model of hedges of canes ("encañizada") used for catching

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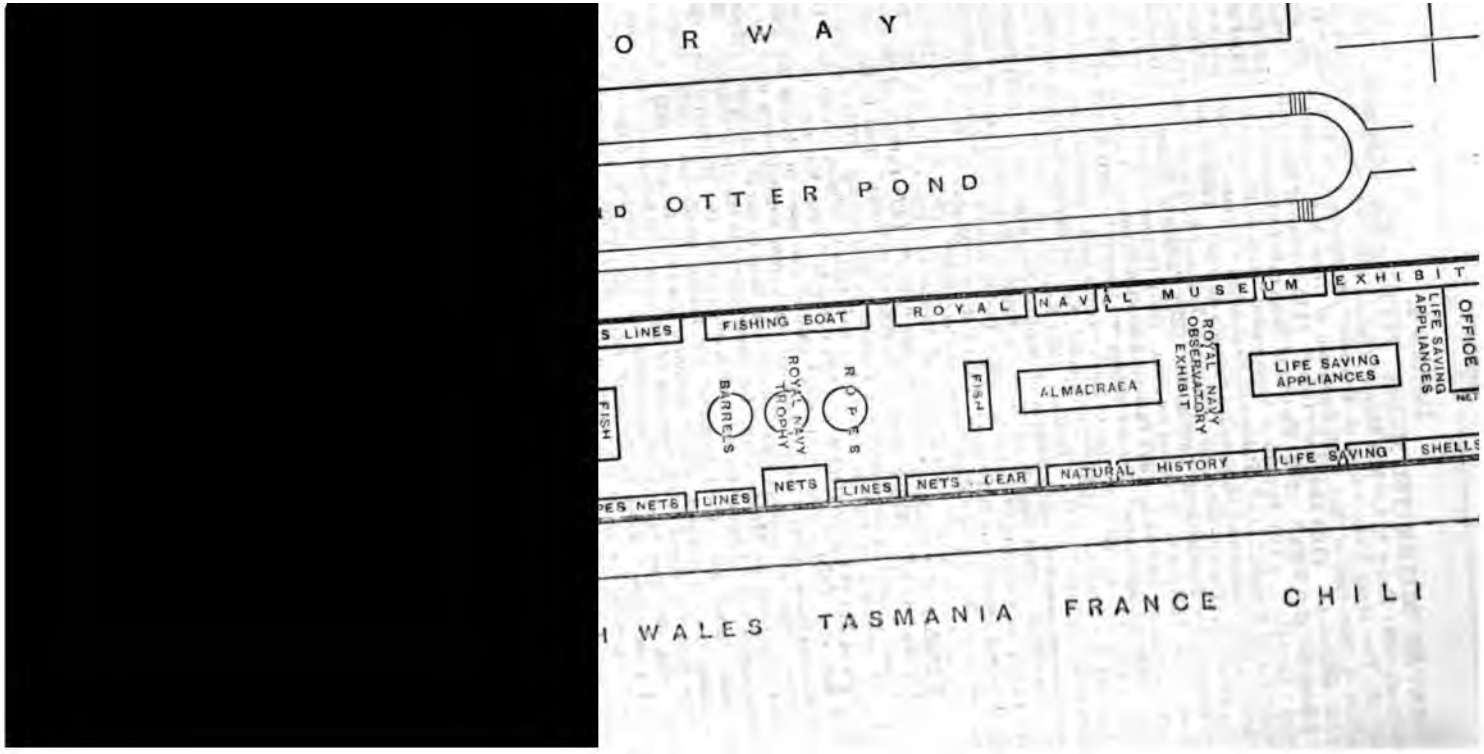

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LIFE SAVING
SHELLS
PES NETS
LINES
WALES
TASMANIA
FRANCE
CHILI

in the "Mar menor" (Inland Sea), Valencia. (95) Ditto, ditto, called "Corral." (96) r Harpoons. (97) Basket for fishing lobsters. (98) Model of Wickers used in Aguadilla erto-Rico) for eel fishing. (99) Basket used in the Guadalquivir river for barbel and eels. 0) Basket used for shrimps, Guadalquivir. (101) Basket used as a tank or fish-pond for ping living fish, Guadalquivir. (102) Basket for fishing ox-eyed cockerel, Valencia. 3) Basket for small cod, Valencia. (104) Basket for congers and eels, Valencia. (105) ket for cuttle-fish, Valencia. (106) Basket for "Surel" and "Llampuga," Valencia. 7) Three Models of Baskets for the same kind of fishing, Valencia.

**ALIER (D. PEDRO), BARCELONA.** (108) Two Rolls forming r portions of sardine net. (109) Net for catching "Codornices" (quails). (110) Another ed for casting. (111) Another unfitted for trawling. (112) Another fitted called a rammel" (Trasmallo) for river fishing. (113) A snare ("Garlito"), large size. (114) teen snares (small size). (115) Twenty patterns of different Meshes. (116) Two parcels "Palangres" cords. (117) Another with "Brasolados" cords. (118) Another with 68 rasolados."

**BORULL (D. JOSÉ), BARCELONA.** (119) Material and ferent nets.

**CANELLAS (D. JAIME), BARCELONA.** (120) Two "Gamnes," traps for eels, &c.

**CORDELERA ESPAÑOLA, PALMA DE MALLORCA.** (121) ckle called "Volantine." (122) Three Cane Fishing Tackles. (123) Three Hanks Thread for sewing. (124) Two Hanks for fishing. (125) Six Hanks, "Curricanes." 6) One Hank of housing. (127) One "Palangre." (128) One harpoon. (129) Two ws of Thread for fishing. (130) Six Assorted "Palangres." (131) A Bag Net "Chinrro." (132) A Bag Net "Lampuyera." (133) One "Trasmallo." (134) One "Moronell" ket for fishing. (135) One Fishing Basket. (136) One "Gánguil" Drag Net. (137) "Tarralla" Hand Net. (138) A Drag Net called "Bou." (139) A Net for tunny ry called "Almadrabilla." (140) A Net for sardines. (141) Implement for fishing and "Radasas." (142) Hemp for coral fishing. (143) Manila Hemp Rope for net madraba Real." (144) Manila Hemp Rope for "Picornella," for fishing with the "Bou." ) Two ditto for double rope ditto. (146) Coil of rope ditto "Chinchorro." (147) Coil pe "Gánguil." (148) Coil of rope "Heniguen," for the buoys Lampuguera.

**DIAZ, JOSÉ, SANLUCAR.** (149) Specimens of Ropes used in nets called "Bou" and "Cazonal."

**FABRA & CO.**, Barcelona. (150) Different kinds of Nets.

**FISHERMEN'S ASSOCIATION OF BERMEO** (Vizcaya). ) "Traiña" or Net for sardines. (152) "Sardango" or Net for sardines. (153) "Sarso" of 12 ft. (154) "Salabarda," Hand Net for picking up sardines. (155) Net of ad (52 yds. long). (156) Net of Thread called "deriva." (157) Net of Thread for cod ng. (158) Net of Thread for "Agujas." (159) Net of Thread for "Bogas," icharros," and "Mubles." (160) Net of Thread called "Remanga." (161) Hook. ) Codinetas," small hooks for calamaryes. (163) "Codinetas" for cuttle fish. (164) lements for making "Codineta." (165) Tackle for "Lubinas." (166) Tackle for bles" (Mullets). (167) Tackle for "Mujarras" or "muxones." (168) Tackle for bras." (169) Tackle for "Brecas." (170) Tackle for "conger." (171) Two Tackles uttle fish. (172) Tackle for "Durdos." (173) "Palangre" for "Barbarinas." (174, ) Two "Palangre" for "Lubinas." (176) Two "Palangre" for "Panchos" or "Chillos." ) "Palangre" for "Chicharros." (178) "Palangre" for "Agujas" (needle fish). (179) arpa" for "pancho." (180) "Salabarda" for quisquillos." (181) "Salabarda" for le fish. (182) "Salabarda" for cod. (183) "Salabarda" for "lija." (184) Codineta uttle fish. (185) Tackle for "cimarrones." (186) Tackle for tunny. (187) Hook for hing tunny. (188) "Palangre" for Bream. (189) "Botavara" for Cimarron." (200) ket for lobsters. (201) Harpoon for cuttle fish. (202) Harpoon for congers. (203) kle for "perlones." (204) Tackle for "colos."

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**FISHERMEN'S ASSOCIATION OF LEQUEITIO** (Vizcaya). (205) Two Tackles for tunny. (206) One Tackle for bream. (207) Palangre for fishing bream. (208) Two Tackles for cod. (209) One Tackle for conger. (210) Tackle for "pocha." (211) Tackle for "lija." (212) Two Tackles for cuttle fish. (213) One Tackle for "Berdel" and "Chicharro." (214) Two Tackles for "agujas" (needle fish). (215) Two Tackles for calamaries. (216) One Tackle for lobster. (217) Model of Net called "Cerco." (218) Four Models of Net.

**FISHERMEN'S ASSOCIATION OF MUNDACA** (Vizcaya). (219) Apparatus called "Traiña." (220) Two Nets for fishing sardines. (221) Tackle for fishing "Lija" (skate). (222) Tackle for cod. (223) Tackle for conger. (224) Tackle for "bonito" (a kind of tunny). (225) Tackle for bream. (226) Tackle for "eskina" (kind of conger). (227) Four Tackles for cuttle-fish). (228) Three Tackles for calamaries. (229) Two Tackles for "cabras" and "chillos." (230) Two Tackles for fishing "chicharros" and "berdeles." (231) One Tackle for "lubina." (232) One Tackle for cuttle fish. (233) "Palangro" for conger. (234) Two Tackles for "Muble" and "Pota."

**FISHERMEN'S ASSOCIATION OF ONDARRUA** (Vizcaya). (235) "Palangres" with the baskets used in it. (236) Buoy for "Palangres" with the baskets used in it and cane. (237) Tackle for picking bait for cod fishing. (238) Tackle for cod fishing and instrument for raising the tackle. (239) Hook for putting the fish on board. (240) Instrument used when there is not bait. (241) Harpoon. (242) Tackle for conger. (243) Four kinds of nets. (244) "Coble" for cod fishing. (245) Basket for fishing lobster. (246) Tackle for "Bonito." (247) Two Tackles. (248) Rod. (249) Instruments for laying ropes. (250) Bait for fishing "Bonito." (251) Tackle used in November and December. (252) Tackle for calamaries. (253) Basket for selling cod. (254) Barrel for "Bonito." (255) Two Nets called "redinas," for carrying the fish in the boats. (256) A Grappler and Signalling Trumpet.

**GORGOLL, JUAN,** Gerona. (257) Photograph representing coral fishing.

**JUANEDA Y TORRES (D. PEDRO),** Mahon. (258) Two Horse-hair tackle.

**HAYNES, THOMAS,** S. Lucar. (259) Drag-net called "Bou," with implements (natural size) for fishing with two 30 H.P. steam-boats.

**MARISTANY BROTHERS,** Coruña. (260) Two portions of Nets equal mesh, such as are used in the apparatus called "Cedazos," in Coruña.

**MAYOR, FRANCISCO,** San Lucar. (261) Two samples of Tackle "Paños de Cazonal."

**PAIRÓ & CO., DN. CARLOS,** Barcelona. (262) Collection of Nets made in their manufactory.

**PERPEN Y RODENAS, JOSÉ,** S. Javier, Murcia. (263) Model of fishing apparatus called "Encañizada."

**TOMÉ, JOSÉ,** San Lucar. (264) Complete set of "Bou" Tackle.

DIVISION II.

**ISERN, ROBERTO,** Seville. (265) Three Cork Buoys for fishing apparatus. (266) Six samples of Cork.

**ZALVIDE Y SAGARMINAGA, JOSÉ,** Bilbao. (267) Apparatus for throwing harpoons, with fittings, photograph, and descriptive notice of it.

**NAVAL MUSEUM,** Madrid. (268) Model of Net mounted on rod so that one person can manage it. (269) Two models of "salabras." (270) Drag for oyster fishing. (271) Drag for oyster fishing called "Triton." (272) Drag for oyster fishing called "Raño."

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37, Queen Victoria St., London, E.C.

DIVISION III.

**MUTIOZABAL AGUINAGA, DN. ANTONIO,** Sn. Sebastian. ) Model of fishing steamer and drawings.

DIVISION IV.

**NAVAL MUSEUM,** Madrid. (274) Model of Cutter for carrying 'Isle of Cuba). (275) Model of Boats used in the tunny fishery. (276) Model of s for the gear called "Corredera fija." (277) Two Models of Boats for the "Bou" drag-Cadiz). (278) One Model of Boat (half block), used in the gear "Cuchara," Barcelona. ) Model of Boat known as "Jamela" (La Guardia). (280) Model of Boat called na" (Galician fishing boat) Rias bajas. (281) Model of fishing boat for the "Xeito." ) Model of Fishing Boat called "Falucho" of Mugardos (Coruña). (283) Model of a h (Coruña). (284) Model of a launch used in Sta Marta, Barquero and Vivero (Coruña). ) Model of a launch known as "Galeon." (286) Model of a Boat for deep-sea fish-Laredo. (287) Model of a Trawler, Bay of Biscay. (288) Model of a Fishing Boat as an experiment. (289) Model of a Fishing Boat called "Ancon," used in Aguadilla rto Rico). (290) Model of a Yawl or Fishing and Merchant Craft of Aguadilla. ) Model of a Yawl, Fishing and Passenger Craft of Aguadilla. (292) Model of a yuco" or Fishing Boat, "Aguadilla." (293) Model of a Fishing Boat, Aguadilla. ) Model of a "Casco," merchant vessel of Philippine Islands. (295) Model of a ambao," passenger and fishing vessel of Philippine Islands. (296) Model of a "Pontin," ing vessel used in Philippine Islands. (297) Model of a "Parao," coasting vessel used hilippine Islands. (298) Model of a "Banca," fishing and passenger vessel used in ppine Islands. (299) Model of a "Guilado," light passenger vessel used in Philippine ds.

**FISHERMEN'S ASSOCIATION OF LEQUEITIO,** Vizcaya. ) Model of Boat, for deep-sea fishing.

**FISHERMEN'S ASSOCIATION OF ONDARRUA,** Vizcaya. ) Model of Fishing Boat.

**MUTIOZABAL AGUINAGA, ANTONIO,** St. Sebastian. (302) l of Sailing and Rowing Fishing Boat, with drawings.

**RIERA Y CAMPS D. PEDRO,** Mahon. (303) Two Models of ing Boats, one for the harbour in Mahon, and another for off the coast.

**ROMANI, D. ALBERTO,** Barcelona. (304) Model of Eight ing Boats for "palangre," sardine, "bou," and baskets fishing with fittings and implements.

**SAN MIGUEL, D. FERMIN,** Santander. (305) Model, draw- and descriptive notice of a deep-sea fishing boat.

**SOLER Y PLANA CARLOS,** Tarragona. (306) Drawings, iptive notice, and boat, called "Faro Submarino," with submarine lights for fishing mplements.

DIVISION V.

**NAVAL MUSEUM,** Madrid. (307) Dressed Hemp, first class, ncia. (308) Dressed Hemp, second class. (309) Oakum, first class, for caulking. ) Oakum, second class, for caulking. (311) Oakum, tarred, second class. (312) m, tarred, second class, of Galicia. (313) Row sedge, "esparto," Valencia. (314) ared sedge, "esparto," Valencia. (315) Box, containing specimens of sail-cloth, ifactured at the Royal Dockyard of Cartagena. (316) Box, containing specimens nvas, tarred canvas, housing cloth and cotton cloth for sails, manufactured at the l Dockyard of Cartagena. (317) Box containing various specimens of hawsers and . (318) Box containing various specimens of tarred hawsers and ropes. (319) Box con-ng various specimens of weft, warp, thread and hemp. (320) Box containing various mens of thread, spun yarn, &c. (321) Column made of specimens of flax, thread, rope-, and canvasses used in the Royal Spanish Navy, and manufactured at the Royal Dock- of Cartagena.

COPY OF TESTIMONIAL GIVEN RESPECTING

**ANDERSON, ABBOTT, AND ANDERSON'S**

REGULATION ARMY WATERPROOF CLOAK.

HEAD QUARTERS, R.V.C., BERWICK-UPON-TWEED, *May* 25, 1877.

GENTLEMEN,—I have sent the Regulation Cloak that I purchased from you some five or six years ago. Will you have the goodness to put a new collar on it, and return to me.

In justice to yourselves I ought to mention that the cloak in question has seen a good deal of rough work, and with the exception of the collar is not very much the worse.—Yours obediently,

(Signed) ROBERT WEDDELL, CAPTAIN, 1st. B., R.V.C.

Messrs. ANDERSON, ABBOTT, and ANDERSON, Queen Victoria Street, London, E.C.

**ALIER, PEDRO,** Barcelona. **(322)** One Roll of Hemp Canvas and another of Cotton Stuff.

**ALPERIZ, JUAN-MANUEL,** Sevilla. **(323)** Pattern of Linen Cloth, Nos. 1 and 5.

**DIAZ RUIZ AGUSTIN,** Almeria. **(324)** Sample of Sedge's Ropework for various applications of fishing.

**DIAZ RUIZ ANTONIO,** Almeria. **(325)** Different Samples of Sedges for various purposes.

**HAYNES, THOMAS.** (326) Sample of "Esparto" (sedge) grass rope for ground rope of trawl net. **(327)** Sample of Tow Line for trawl net. **(328)** Sample of Hand-made Twines for net making

**MERCADAL Y PORTELLA,** Mahon. **(329)** Two Samples of Sedge.

**MURRAY & CO.,** Almeria. **(330)** Sample of Sedge.

**PADILLA, JUAN,** Almeria. **(331)** Various Samples of Hemp.

**PONSETI BROTHERS,** Mahon. **(332)** Patterns of Cotton Cloth, Dressed Hemp, and Fishing Thread.

**GUZMAN, JOSÉ,** Sevilla. **(333)** Two Coils of Manila Rope, and one of Hemp Rope. **(334)** Thread for Fishing and Nets of different sizes. **(335)** Six Hanks of Thread for fishing. Seven Samples of Thread for fishing tackle.

## Division VI.

**ROYAL NAVAL OBSERVATORY OF S. FERNANDO.** **(336)** One Barometer, one Psicrometer, one Hydrometer, one Deep Sounding Thermometer, one Thermometer for the surface of the water, and one Loch, all made in the workshops of the observatory.

## Division VIII.

**NAVAL MUSEUM,** Madrid. **(337)** Samples of Thread for Nets from the manufactory of Messrs. Rivas of Vigo. **(338)** Samples of Thread from Messrs. Domenech of Badalona. **(339)** Sedge's Twines, from the manufacture of M. Just, Alicante. **(340)** Sedge's Twines from the "Coropéra" Blanes. **(341)** Set of Needles for making nets by hand. **(342)** Samples of Nails, coast of Valencia.

## Division IX.

**LIFE BOAT SOCIETY OF S. SEBASTIAN.** **(342)** Two Cork Jackets. **(344)** Box for Donations and Regulations of the Society.

**"DIPUTACION PROVINCIAL" OF SEVILLA.** **(345)** Two Mattrasses for saving life, made of cork. **(346)** Two Pillows for saving life, made of cork. **(347)** A Jacket and Belt for saving life, made of cork.

**DON P. P. DE LA SALA,** of Seville, and of Bond Court Chambers, Walbrook, London. **(1)** "*Suberis Carbo*" Life Buoy, possessing double buoyancy than cork. **(2)** Cane frames used in the manufacture of the above Life Buoys. **(3)** Impervious charcoal Life Buoys, lighter than cork. **(4)** "*Suberis Carbo*" Life-saving Ship's cushions. **(5)** "*Suberis Carbo* Life-saving hassocks. **(6)** "*Suberis Carbo*" Life-saving Ship's chairs. **(7)** "*Suberis Carbo*" Life-saving Naval stool. **(8)** "*Suberis Carbo*" Life-saving Passenger's Deck Chairs. **(9)** Flask containing the eighth part of an ounce of *Suberis Carbo*, and fourteen and a half ounces of distilled water, showing their relative volumes. Specific gravity 0·080. **(10)** Flask containing the fourth part of an ounce of "*Suberis Carbo*," which resistance to immersion in sea water is equal to 59 lbs. per cubic foot, less weight of casing. **(11)** Model of Life-saving Ship's Benches. **(12)** Best Extremadura cork bark Life Buoy. Best Extremadura cork bark Life Buoy uncovered. Specific gravity 0·238. **(13)** Life Belts for fishermen, crews and passengers. **(14)** Life-saving pillows and mattresses &c., made of Best Extremadura cork

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WORKS—LIMEHOUSE, E.

, *Suberis Carbo* and impervious vegetable fibres. (15) Tube-joined pine boards for the truction of Life-saving rafts and other naval purposes. Specific gravity 0·217. (16) Solid boards of same dimensions. Specific gravity 0·601. (17) Fishing Folding Boat, unsinkable, psizable, easily carried by land, and readily handled in the water. The outside boxes, l with *Suberis Carbo*, give this little craft a buoyancy equal to 120 lbs. (18) Models ring the way of constructing the Life-saving Folding Canoes. (19) Models of Life-saving ting Folding Punts and Wherries. (20) Models of pleasure Folding Boats, and of a rproof canvas covering, for ordinary boats on board vessels, which can be easily converted a Life-saving oblong flat bottomed craft.

DIVISION XXI.

**TORT JOSÉ OF VICH**, Barcelona. (348) A Fisherman's Dress, posed of vest, trousers, overcoat, and material for drawers.

DIVISION XXV.

**NAVAL MUSEUM**, Madrid. (349) Implements used in the ng establishments on the coast of Galicia.

DIVISION XXVI.

**BÁRCENA & OJEDA ALFONSO**, of Laredo, Santander. (350) rty-six Tins of Sardines in Oil, and twelve tins in Tomato Sauce.

**BARRIO, EULOGIO**, of Laredo, Santander. (351) Twelve Tins ardines; five of Cod, six of Bream, seven of Calamary, and two of Sea-Duck in oil. Twelve of Sardines, five of Cod, and six of Bream in tomato sauce; six tins of Bream, a barrel of hovy, one of Sardines, and another of "bonito," salted.

**CAAMAÑO & CO.**, Noya, Coruña. (352) Two Tins of Bream in ato sauce; two tins of Bream, pickled; two Conger, pickled; two Conger in oil, and one omato sauce; two tins of Pickled Lobster, one of Pickled Lobster at the catalan's ion, five of Lamprey, one of Sole in oil; two of Sole, pickled; three of Trout in oil; one Cod in oil; one of Cod, pickled; two of Cod, with peas; one of Cod, with green sauce; of Mero in oil; two of Mero, pickled; one of Mero, with tomato sauce; seven of Cockles, of Oysters, three of Turbot, two of Bream, two of Red Mullet, two of "Perceves," two ied Perch, two of Lobster, four of roasted Partridges, and two of Partridge stewed.

**CACHO & SON**, Laredo, Santander. (353) Twenty-four Samples ardines in Oil and tomato sauce. A cask of Sardines, Cod, Bream, Conger, Eel, Cuttle , and Sea Duck.

**CARREÑO VALDES ALEJANDRO**, Noya, Coruña. (354) y-six tins of Turbot, Conger, Bream, Calamaries, Red Mullet and Trout in oil and ato sauce.

**FUENTECILLA, GONZALEZ**, Primitivo, Laredo. (355) Thirty- Tins of Sardines and Bream in oil and tomato sauce.

**GARAVILLA, CESÁREO**, Lequeitio, Bilbao. (356) Thirty-eight of Bream, Tunny, Anchovies, Eels, Calamaries, Lubinas, Cod, Trouts, Salmon, Soles, and r fishes in oil, tomato sauce and green peas.

**GODAY GUAL JUAN**, from Villanueva de Arosa Pontevedra. 7) One hundred and forty-eight Tins of Calamaries and Sardines in oil.

**LUMBRERAS FRANCISCO**, Bilbao. (358) Eighty-eight Tins ifferent Fishes, from the manufactory called "La Bilbaina," and two descriptive notices it the preparation of preserved food.

**MARISTANY BROTHERS**, Coruña. (359) A Box of Pressed lines, a Barrel of Salted "Corbina," a Barrel of Salted Sardines, a Barrel of Salted lines in a Glass Bottle.

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**PEREZ CASARIEGO, FERNANDO,** from Tapia (Oviedo). (360) 208 Tins of Tunny, Conger, Sole, Bream, Carp, Cod, Salmon, and Lobsters, in Oil and Fried.

**PERPEN RODENAS, JOSÉ,** S. Javier, Murcia. (361) Six Bottles of Preserved Fish.

**PORTAL, ALEJANDRO,** Muros. (362) A Cask of Pressed Sardines.

**VILLOCH, FEDERICO,** Coruña. (363) Six Bottles of Cockles three years old, artificially bred in the park of Burgo, Coruña.

**YARZA, CEFERINO,** Santander. (364) 98 Tins of Sardines and Calamaryes, in Oil and Tomato Sauce.

DIVISION XXVII.

**DE LA CONCHA, D. DIEGO,** Cudillero (Oviedo). (365) Three Bottles of Medicinal Skate Oil in its primitive forms. (Those fishes were taken at a depth of about 600 fathoms in the Cantabrian Sea. It is used for wounds, as purgative and an advantageous substitute to the cod-liver oil.

**MARISTANY BROTHERS,** Coruña. (366) A Bottle of Sardine Oil immediately after pressing. (367) A Bottle containing Lees of Sardine Oil; used in dealing with tanned leather.

**RAMOS, RAFAEL,** S. Lucar. (368) A Bottle of Oil made from the Liver of the Tope.

**VALCARCEL, DESIDERIO,** Cudillero (Oviedo). (369) Four Bottles of Skate Liver Oil; Four Bottles of Skate Liver Oil, refined; Four Bottles of Skate Liver Oil, with Iron; Four Bottles of Skate Liver Oil, with Iodine and Iron.

**YEVES & CO.,** London. (370) Twelve Bottles of Tunny and Sardine Oil.

DIVISION XXVIII.

**DIRECCION DE RENTAS ESTANCADAS,** Madrid. (371) Three Samples of Salt from the pits of Torrevieja, Aljcante, of the Government Property.

**PERPEN Y RODENAS, JOSÉ,** San Javier, Murcia. (372) Samples of Salt of San Pedro del Pinatar, Murcia.

**SOCIETY CONCIERTO SALINERO,** San Fernando, Cadiz (373) A Case with Salt from the shores of the Bay of Cadiz.

DIVISION XXIX.

**NAVAL MUSEUM,** Madrid. (374) Oil extracted from Dolphin Fat, Canary Islands). (375) Oil extracted from Liver of the Ruffle, Canary Islands (376) Oil extracted from Cod Fish, prepared by fishermen of Laredo. (377) Oil extracted from Kelme, first distillation, prepared by fishermen of Laredo. (378) Oil extracted from the bowels of "Pardela." (379) Oil extracted from "Kelme," second distillation (380) Oil extracted from "Pardela" Liver. (381) Sardine Scales for manure. (382) Manure called "Caloca." (383) "Xebra," a kind of weed employed as manure and for packing.

**MARISTANY BROTHERS,** Coruña. (384) A Bottle of Sardine Scales, used as a manure.

DIVISION XXXII.

**NAVAL MUSEUM,** Madrid. (385) "Minchas," kind of shell from which the ancients used to extract their purple. (386) Mother-o'-pearl ("Nácar de Luceros") Shells from Galicia. (387) Mother-o'-pearl, called Haliotis. (388) Shells of Cockles, for preparing iridescent mother-o'-pearl. (389) Tortoise Shell "Carey," polished

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**HARBOUR MASTER,** Alcudia, Valencia. **(390)** Sample of Coral

**GORGOLL, JUAN,** Palafurgell, Gerona. **(391)** Sample of Raw ral. **(392)** Twenty-three different Shells. **(393)** Some Shells used in decorations and ificial flowers. **(394)** Some Raw Sponges.

DIVISION XXXIII.

**NAVAL MUSEUM,** Madrid. **(395)** Collection of Barrels of ech Tree and Chesnut Wood, used for pickling fish.

**ÀRANDIA Y GARCIA, JOSÉ,** Santander. **(396)** Two Barrels salting fish; two Buckets, two Scoops, two Tubs, and two Barrels for liquors.

**MONTSERRAT, RAMON,** Pueblo Nuevo del Mar, Valencia. 97) Two Barrels of different make, English and Portuguese.

DIVISION XLVI.

**NAVAL MUSEUM,** Madrid. **(398)** Collection of Spanish Mollusca. 99) Collection of Spanish Oysters.

DIVISION XLVII.

**GORGOLL, JUAN,** Palafurgell, Gerona. **(400)** Five Specimens Sea Urchins.

DIVISION L.

**GORGOLL, JUAN,** Palafurgell, Gerona. **(401)** Twelve Speci- us of various Species of Crustacea.

DIVISION LI.

**NAVAL MUSEUM,** Madrid. **(402)** Piece of Planking from the ssel "Niña Regina," of Torrevieja, with part of the Sword of a Fish (sword fish) which rced this plank at 9 p.m. on the 6th of July, 1864, at more than thirty-five miles off the ast of Algeria, on her way to Spain. **(403)** Piece of Planking from a coasting schooner Habana, pierced by a sword fish in 1853.

**GORGOLL, JUAN,** Palafurgell, Gerona. **(404)** Two Flying shes and Two Sea Horses.

DIVISION LII.

**NAVAL MUSEUM,** Madrid. **(405)** Sea Turtle. **(406)** Turtle 'arey." **(407)** Turtle called "Fanduca" or "Franca."

DIVISION LVIII.

**NAVAL MUSEUM,** Madrid. **(408)** Annual of the Spanish Society Saving Life. **(409)** Annual of St. Sebastian. **(410)** Annual Report of the same society. 11) Regulations of Fishermen's Society of Bermeo (Vizcaya) and concessions granted by the ng Charles the First (1527), and confirmed by Phillip the Second (1567). **(412)** Regulations Fishermen's Society of Bermeo in force since the year 1880. **(413)** Regulations of the shermen's Society of Lequeitio (Vizcaya). **(414)** Regulations of Fishermen's Society of darrua (Vizcaya), Diplome of Honour and Plan of the Society's House. **(415)** Regulations the Fisheries in the "Mar Menor." **(416)** Regulations for Development and Improvement Shell Fish Fisheries (Mollusca). **(417)** Regulations relating to Tunny Fisheries. **(418)** nual of the Permanent Commission of Fisheries for 1868, and Report about the Fishing lustries, prepared by special order by D. Cesareo Fernandez Duro, Captain of R.S.N. **(419)** nual of the Permanent Commission of Fisheries for 1869. **(420)** Gold and Silver Medals d by the Members of the Spanish Life Saving Society. **(421)** Three Photographs of the at House of the Life Saving Society of Cadiz. **(422)** Report on the importance of the dine Fishery in Galicia and the Draft of Contract between the Fishermen and the Owners, Messrs. Maristany Brothers, Coruña. **(423)** A Map of Spain showing the Saving Life tions.


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various Specimens of Natural History, more specially relating to t
D. Antonio Parra. (434) "Arte Cisoria," or treatise written by the
(D. Enrique de Aragon). (435) Treatise of Natural History, printed i
by the Doctor of Medicine and Philosopher D. Geronimo de Huerta. (
ploration of the north-west coast of Spain, by D. Mariano de la Paz Grael

**D. JOSÉ LOPEZ CORTÉS.** (437) Essay on Fis
by D. José Cornide.

**D. JOSÉ PERPEN Y RODENAS.** (438) Des
the "Mar Menor" and its Industries, by D. José Lopez Cortés.

# SWEDEN.

(*For Plan, see p.* 358.)

Owing to the fact that Sweden, which is almost entirely surrounded by water (its coast-line is 2,500 kilom.), has a great many rivers and streams, and next to Finland, the greatest number of lakes of any country in Europe, (one-twelfth of the area of Sweden consists of water) —the very nature of the country renders it peculiarly adapted to fish-culture; and hence it follows that its fishery grounds ought to be one of the chief sources of the trade and industry of Sweden. The waters of the coasts differ considerably from one another, as well as from the waters of the lakes, a circumstance which causes varieties in the fish fauna. The number of known species of fish in Sweden is at present about 170, of which, however, only about 50 are commonly caught for use. The most important fisheries are:—

A. *The Herring and Sprat Fisheries of the Baltic and the West Coast.*—These, no doubt the most important fisheries, are carried on from the inmost part of the Gulf of Bothnia as far as the northern part of the province of Bohus. The nets used by the fishermen are standing nets (*sältgarn*), seines (*vadar*), and driftnets (*drifgarn*). The boats used in the Baltic are mostly open, and have a crew of two to three men; on the west coast the boats used in drift-fishing are decked, and have from three to five men. Seine fishing requires at least from ten to fifteen men for each seine. On the western and southern coasts of the country the herring fishery is generally carried on by a population living together in large fishing villages, and obtaining their subsistence solely from the fishery. But along the coasts of the inner Baltic from Kalmar to Haparanda, as well as the coast of the island of Gotland, the herring fishery is carried on partly by people who live in the interior and only visit the archipelagoes during the fishing season, and partly by fishermen from the various islands. The Baltic herring (*strömming*), a smaller variety of *Clupea harengus* L., is sold either fresh in the towns along the coast, or else salted in barrels. The barreled article is generally sold in Sweden—salted herring being the daily food of the Swedish peasant; but of late years it has also been exported to Germany. Herrings (*Clupea harengus*) and sprats (*Clupea sprattus*) are also caught, especially of late years, during the autumn and winter months, in the Skager-Rack, on the coast of the province of Bohus. The herrings are partly sold fresh and partly salted in barrels or smoked. The sprats likewise are partly sold fresh, and partly pickled or spiced, while some are prepared as "anchovies," and sold under that name, although of course they are a different kind of fish from the true anchovy. Considerable quantities of these have been exported during the last few years. The yearly revenue of the herring and sprat fisheries of the whole country may be estimated in round numbers at 3,865,000 Swedish crowns, of which sum 2,650,000 is the revenue of the herring fishery in the Baltic and the Sound

B. *The Coast and Sea Fisheries (with the exception of the Herring, Sprat, Salmon and Eel Fisheries).*—Near the west coast and in the Baltic Sea the fishery is carried on in small vessels, but on the banks in the Skager-Rack and off the west coast of Skagen and Norway in larger vessels, called *bank-smacks*, which have a crew of twelve or fourteen men. The tackle used for the bank-fishery is the "Stor-backa," a long line that is laid out on the banks, and often laid at a depth of from 100 to 200 fathoms. As a bait either mussels or bits of fish are used. With this tackle are caught the cod, coalfish and haddock (*Gadus morrhua*, L., *G. virens*, L., *G. aeglefinus*, L.), the ling (*Molva vulgaris*, Nills.), the tornback (*Raja clavata*, L.), and the halibut (*Hippoglossus vulgaris*, Cuv.) Of the fish caught part is sold fresh, but the greater part is prepared as "stockfish" or salted, either by Norwegian merchants or by fish-curers in the province of Bohus. From the liver "codliver oil" is prepared, and the roe is salted to be afterwards sold for bait to the sardine fisheries in France. The annual revenue of these fisheries in Skager-Rack, together with the revenue of the mackerel and the lobster and oyster fisheries carried on in the province of Bohus, is computed at 1,339,500 Swedish crowns. Besides this, the statistical reports from the province of Scania give the

value of this fishery at 308,600 Swedish crowns; and as no statistical reports concerning the fishery in question in the other provinces are to be had, it may for these provinces, without exaggeration, be estimated at an annual sum of 351,900 Swedish crowns, which makes the annual revenue of these fisheries for the whole kingdom, in round numbers, 2,000,000 Swedish crowns.

C. *The Lake and other Freshwater Fisheries*, with the exception of the salmon fishing, are, in the south and central parts of Sweden, carried on principally for the perch (*Perca fluviatilis*, L.), the pike perch (*Lucioperca sandra*, Cuv.), the pike (*Esox lucius*, L.), the bream (*Abramis brama*, L.), and other fishes of the carp tribe, as well as for the burbot (*Lota vulgaris*, Cuv.), the eel (*Murena anguilla*, L.), the lampern (*Petromyzon fluviatilis*), and the smelt (*Osmerus eperlanus*). A tolerably good income in these parts of Sweden, with the exception of the westernmost districts, is also to be had from cray-fish (*Astacus fluviatilis*), which are often very numerous in the smaller lakes and rivers. In the lakes in the north of Sweden especially are caught some species of the genus *Coregonus*, and also the above-mentioned species. The fisheries in the lakes are carried on as a livelihood by a population of fishermen residing on the shores; as a subordinate pursuit by farm people, cottagers, artisans and soldiers, who either possess fishing-licenses or have procured such by agreement. The products of these fisheries are mostly disposed of in a fresh state in the neighbourhood of the fisheries, but of late years part of them have been preserved in ice and exported to Germany. The reports concerning the revenue of these fisheries are very incomplete, but the annual revenue of all the lake and freshwater fisheries has been estimated in round numbers at 2,000,000 Swedish crowns, which is no doubt much too little.

D. *The Salmon Fisheries.*—The richest of the many salmon-streams of Sweden are the Torne, Lule, Ume, Angerman, and Ljusne rivers in Norrland, and the Viska, Ätran, Nissa, Laga and Qvistrum in the west of Sweden. A great quantity is also taken in the Lake Wener. The salmon fisheries are carried on in the Norrland rivers from the end of May until the beginning of September; in the rivers of the west of Sweden from the beginning of April until the middle of July, and along the coasts of Scania and Blekinge in the winter months, if the ice does not prevent. The largest salmon fisheries in the country are those at Elfkarleby in Upland, and at Mörrum in Blekinge. The salmon caught in the rivers on the west coast is considered better than the salmon taken in the rivers on the east coast, and is quite as good as the Scotch. The salmon is now-a-days mostly sold fresh, either in Sweden or abroad, in which latter case it is packed in ice and exported, viâ Stockholm, Gothenburg, or Malmö, by wholesale houses to England and Germany especially to Berlin. The greater part of the salmon taken on the south coast of Sweden in winter is sent to Germany or Denmark to be smoked. The annual revenue of our salmon-fisheries may safely be estimated at 625,000 Swedish crowns.

E. *The Eel Fishery (with Traps on the Coasts).*—Very high prices being paid for the eel, the catching of this fish will become one of the most valuable fisheries of the Baltic. This kind of fishery is carried on from the town of Grisslehamn as far as the western coast of the province of Scania. The eel is caught by means of large traps (*hommor*), and the best time for catching it is in September and October. The annual revenue of this fishery may safely be estimated at 150,000 Swedish crowns. The value of all the fisheries of the kingdom, estimated approximately, but judging from all appearances by no means too high, should, as shown above, amount to—A. Herring and Sprat Fisheries, 3,865,000 Swedish Crowns: B. Coast and Sea Fisheries, 2,000,000 Swedish Crowns; C. Lake Fishery, 2,000,000 Swedish Crowns; D. Salmon Fishery, 625,000 Swedish Crowns; E. Eel Fishery with Traps, 150,000 Swedish Crowns—Total, 8,640,000 Swedish Crowns.

For the *Superintendence and Improvement of the Fisheries* the following officials are appointed:—An Inspector of the fisheries in fresh waters and on the east coast of Sweden, with two assistants and one instructor in fish-breeding. Besides these government fishery officials, there are, in certain provinces and waters, fishery *overseers* appointed, whose chief duty is to see that the enactments relating to fisheries are observed. Of these overseers *some* are paid by grants from the State, others by "Landsting" and agricultural societies, *conjointly* with the owners of the fishing waters. The direction and superintendence of the *sea-fishery* on the west coast of the kingdom, is entrusted to an overseer, who is under

the control of the Governor of the governmental district of Gothenburg and Bohus. For the encouragement of fisheries the government for some years gave premiums to sea-going fishing smacks from the province of Bohus, and in the last few years it has made effective attempts to introduce drift-net fishing in the herring-fishery off the Bohus coast, as well as in the Gulf of Bothnia. Through the liberality of the Parliament it has also been possible of late years to contribute considerable sums for the construction of several ports for the fishing trade. Besides this, the Royal Agricultural Societies of the different governmental districts contribute from their funds to the expenses of promoting the fishery interests of their respective districts. In 1869 a company was established, with the aid of the Royal Agricultural Society of that district, for insuring fishing vessels and gear for the governmental district of Gothenburg and Bohus; and this company still carries on its operations.

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DIVISION I.

1. **ANDERSSON, GÄCK J.**, Fisherman, Råå, Raus, Skåne. (1) Eel Line. (2) Long Lines for Codfishing. (3) Plaice Net, new. (4) Herring Net. (5) Half of Cod Net, of flax. (6) Cod Hook ("Pilk"). (7) Cod Hook (small).

2. **ANDERSSON, N.**, Sub-Inspector of Fisheries, Åhus, Skåne. (8) Eel Trap ("Ryssja").

3. **ANDERSSON, LUND. O.**, Fisherman, Refhusen, Ystad, Skåne. (9, 10) Herring Nets with meshes of different size. (11) Cod Net. (12) Salmon Net. (13) Long Line for Salmon Fishing. (14) Cod Line. (15) Long Line for catching Flounder and Guffer-eel (*Zoarces viviparus*). (16) Bunt belonging to Sand-eel Seine, of netting, half natural size, but with the meshes natural size.

4. **"ARCTIC OCEAN" COMPANY**, Göteborg. Aktiebolaget Ishafvet, Göteborg. (17) Express Rifles. (18) Seal Clubs. (19) Flaying Knife, with sheath and steel used in whetting. (20) Towing Harness and Line, for dragging killed Seals on the Ice.

5. **ARESCHOUG, O.**, Landed Proprietor, Esperöd, Kivik, Skåne. (21) Eel Trap ("Ålhomma"), with map showing the extent of the Fisheries and manner of setting the gear.

6. **BACKE, N.**, Boat-master, Råå, Raus, Skåne. (22) Net of Home-spun Linen Yarn, made 22 years ago in the fashion then used.

7. **BERGIUS, G.**, Inspector of Fisheries for Gestrikland and Helsingland, Gefle. (23) Two standing Nets for catching Herring in the Baltic ("Klumpskötar") complete. (24) Drift Net from Gotland, experimentally used in Drift Fishing on the coast of Gestrikland and Helsingland. (25) Seal Trap.

8. **BJÖRK, N.**, Sub-Inspector of Fisheries, Råå, Raus, Skåne. (26) Eel Trap or Hoop Net ("Ålrusa"). (27) Cod Net of Cotton. (28) Herring Net. (29) Cod Line. (30) Whiting Line.

9. **BOBERG, F.**, Fisherman, Skillinge, Simrishamn, Skåne. (31) Salmon Line (Long Line for Salmon Fishing in the Baltic).

10. **CHRISTERSON, C.**, Light-ship Keeper, Falsterbo, Skåne. (32) Sand Eel Seine.

11. **CHRISTIANSSON, C. J.**, Merchant, Olofsholm, Malmön, Bohuslän. (33) Long Line ("Storbacka") for catching Lingfish and Cod. (34) Long Line ("skrejbacka") for Codfishing. (35) Long Line called a Haddock Line ("Koljebacka") for catching Haddock and small species of Codfish. (36) Mackerel Net. (37) Mackerel Line. (38) Mackerel Line.

11*a*. **DICKSON, O.**, Gothenburg. (38*a*) Mackerel Nets. (38*b*) Cod Net. (38*c*) Long Lines.

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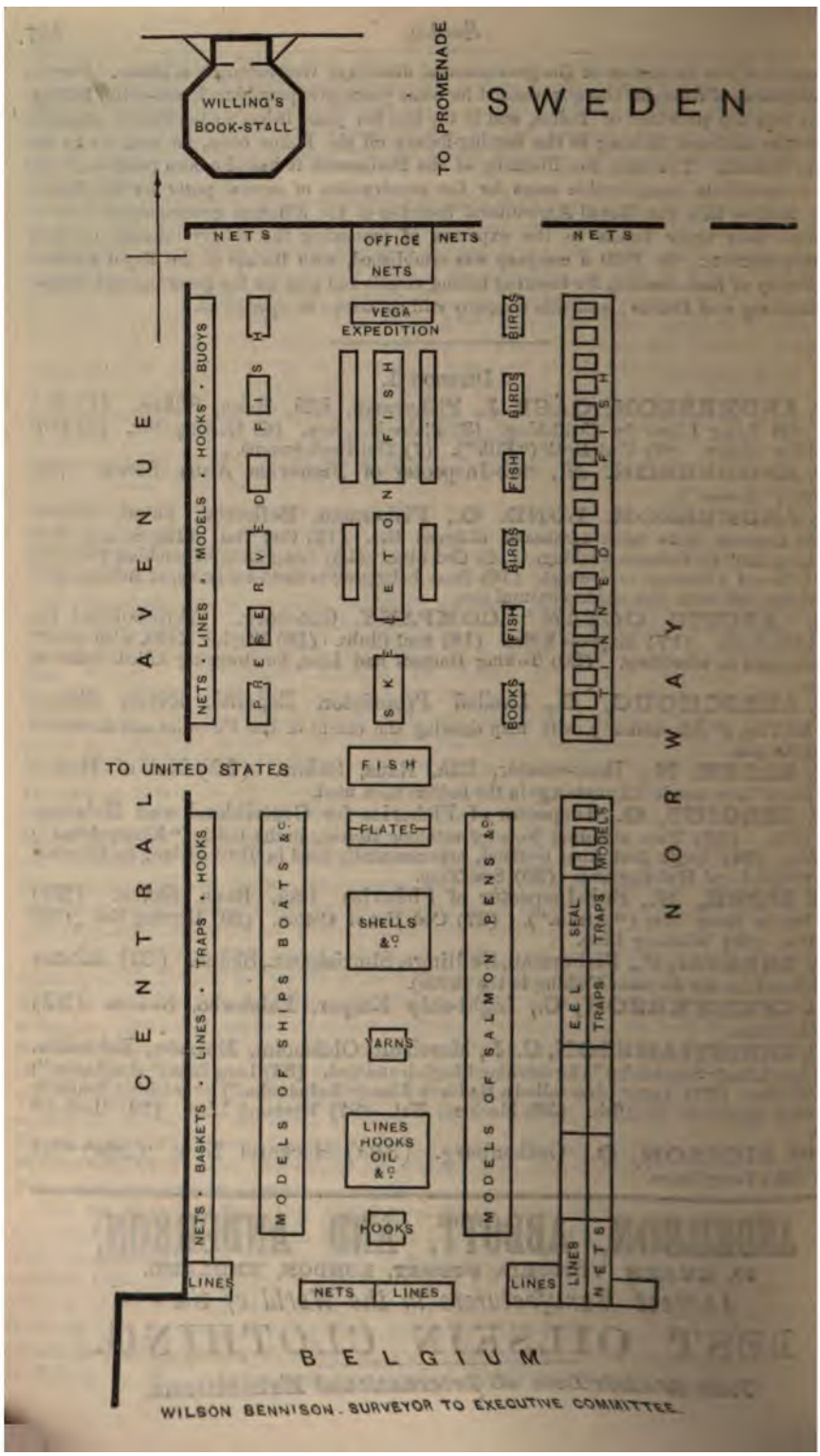


WILSON BENNISON. SURVEYOR TO EXECUTIVE COMMITTEE.

12. **EXECUTIVE COMMITTEE (THE) OF THE ROYAL AGRICULTURAL SOCIETY OF SOUTH WESTROBOTHNIA** (Vesterbottens Läns Kongl. Hushållnings Sällskaps Förvaltnings Utskott), Umeå. (39) Standing Net ("Sköt) for catching Herrings in the Baltic. (40) Part of Salmon Net.

13. **HENRICKSSON, A.**, Fisherman, Borstahusen, Landskrona, Skåne. (41) Cod Net, new and untanned, of flax.

14. **HÅKANSSON, A.**, Fisherman, Sub-Inspector of Fisheries, Knäbäck Maglehem, Skåne. (42) Eel Trap ("Ålhomma").

15. **IGGLUND, L.**, Fisherman, Hudiksvall, Helsingland. (43) Model of Great Trap ("Stor-ryssja").

16. **JONASSON, P.**, Fisherman, Råå, Raus, Skåne. (44) Flounder Net. (45) Cod Net. (46) Long Lines ("Backor").

17. **JÄPPSSON, L.**, Fisherman, Baskemölla, Simrishamn, Skåne. (47) Sand Eel Seine.

18. **JÖNSSON, L.**, Fisherman, Kåseberga, Svenstorp, Skåne. (48) Eel Trap.

19. **LARSSON, A.**, Fisherman, Råå, Raus, Skåne. (49) Model of Standing Net Trap ("Bottengarn"). (50) Herring Net.

20. **LARSSON, C.**, Fisherman, Kråkvik, Valdemarsvik, Östergötland. (51) Model of Sprat (Swedish Anchovy) Seine.

21. **LARSSON, P.**, Fisherman, Skillinge, Simrishamn, Skåne. (52) Herring Net.

22. **LIMBORG, H.**, Director of Fisheries for the Provinces of Södermanland and Nerike. (52*a*) Eel Trap ("Ålhomma").

23. **MÅNSSON, S.**, Fisherman, Nybro, Svenstorp, Skåne. (53) Part of Sand Eel Seine with appurtenances.

24. **MÅRTENSSON, N.**, Fisherman, Kåseberga, Svenstorp, Gov. Distr. of Malmöhus, Skåne. (54) Salmon Seine.

25. **MÅRTENSSON, O.**, Fisherman, Käseberga, Svenstorp, Skåne. (55) Cod Lines.

26. **NILSSON, J.**, Fisherman, Råå, Raus, Skåne. (56) Herring Net. (57) Cod Hooks.

27. **NILSSON, N.**, Fisherman, Skillinge, Simrishamn, Skåne. (58) Cod Line.

28. **NILSSON, P.**, Fisherman, Kivik, Skåne. (59) Various Fishing Gear.

29. **NORDENSKIÖLD, A. E.**, Baron, Professor, Royal Swedish Academy of Sciences, Stockholm. Collection of Fishing Gear, &c., from Chukches and Eskimos, arranged by Kornelia Pålman. 60—95 from Chukches.) (60—65) Fishing Rods. (66, 67) Sinker of Ivory. (68) Leister of Bone. (69) Fishing Net, used for catching Salmon. (70) Net made of strong seal skin thongs for catching seals. (71) Ice Scraper of Wood and four Seat Claws, intended for decoying the seal from its hole. (72) Ice Scraper of Wood and two Seal Claws, used in the same manner as No. 71. (73) Harpoon, used to kill the walrus and the largest kinds of seals. (74, 75) Bird Darts of Wood. (76) Wooden Handle for throwing the bird darts Nos. 74 and 75. (77) Dart of Wood. (78) Dart of Wood with Ivory Point. (79) Dart of Wood with Carved Ivory Point. (80) Whip Sling for casting the darts Nos. 77, 78, 79. (81) Seventeen Arrows, with ivory, bone, or iron points. (82) Seventeen Arrows with ivory, bone, wooden, or iron points. (83—86) Four Quivers of Red Leather with a Beautiful Embroidery. (87, 88) Two Bows consisting of a slightly bent elastic piece of wood. (89) Bow, old, larger than Nos. 87 and 88, carefully made of a sharply bent, elastic piece of wood. (90) Bow, old, in the form resembling No. 88, but consisting of three pieces of wood. (91) Crossbow of

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**WORKS: LIMEHOUSE, E.**

Wood with a String of Seal Skin. (92, 93) Two Bird Slings. (94) Ice Mattock of Wood and Bone. (95) Two Snow Scrapers of Carved Reindeer Horn. (96—129 from Eskimos.) (96—99) Fishing Rods. (100—107) Sinkers of Stone and Ivory. (108, 109) Fish Hooks of Wood with Ivory Points. (110) Leister of Bone and Wood. (111, 112) Fishing Nets of Thongs of Seal Skin. (113) Fishing Net of partly twisted and partly plaited sinews. (114) Harpoon Point of Bone and a species of Nephrite. (115—117) Harpoons. (118) Harpoon Float. (119) Flint Dart Point. (120, 121) Two Whale Harpoons of Wood with flint point. (122, 123) Two Bird Darts with Shaft of Wood. (124, 125) Two Wooden Handles for throwing the bird darts Nos. 122 and 123. (126) Seventeen Wooden Arrows or Harpoon Ends. (127) Quiver of Seal Skin containing five arrows. (128) Quiver of Seal Skin containing three arrows. (129) Bow, short, of a slightly bent piece of wood, strengthened by skin thongs.

*** For fuller details as to Fishing Gear, &c., and Natural History, *see* SWEDISH SPECIAL CATALOGUE.

29*a*. **OLSSON BOSE, M.**, Fisherman, Råå, Raus, Skåne. (129*a*) Flounder Net.

30. **OLSSON, M.**, Fisherman, Hvitemölla, Brösarp, Skåne. (130) Herring Net. (131) Salmon Net. (132) Flounder Net. (133) Long Line for salmon fishing in the Baltic.

31. **OLSSON, S.**, Fisherman, Råå, Raus, Skåne. (134) Mackerel Net, tanned, used. (135) Mackerel Net, untanned, new. (136) Drift Net for herring fishing, tanned, used. (137) Drift Net for herring fishing, untanned, new. (138) Bottom Standing Net, tanned, new. (139) Flounder Net, untanned, new. (140) Plaice Net, new. (141) Plaice Net, tanned, used.

32. **POUSARD, P. E.**, Lighthouse Keeper at Saltvik Point, Hudiksvall, Gov. Distr. of Gefleborg, Helsingland. (142) Large Trap for catching Gwyniad in the Baltic. (143) Large Net ("Stornät") for Catching Gwyniad in the Baltic. (144) Large Net ("Storsköte") for catching Herring in the Baltic. (145. *See* Swedish Cat.)

33. **ROYAL AGRICULTURAL SOCIETY OF THE PROVINCES OF GESTRIKLAND AND HELSINGLAND**, Gefleborgs Läns Kongl. Hushållnings Sällskap. Gefle. (145) Seal Trap ("Skältina").

34. **ROYAL SWEDISH AGRICULTURAL ACADEMY**, (Kongl. Landtbruksakademien), Stockholm. (146) Drift Net from Skåne for Salmon Fishing in the Baltic. (147) Flounder Net from Halland. (148-157) Herring Nets from Halland. (158-165) Herring Nets from Gotland. (166) Standing Net ("Sköt") for catching Herring, used off the Stockholm Coast. (167) Herring Net from Bleking. (168, 169) Herring Nets. (170-173) Standing Nets, used in the Herring Fishery off the Coast of Stockholm. (174) Deep-water Standing Net from the Herring Fisheries of Norrland. (175) Seal Net. (176) Sand Eel Seine, with cloth bag. (177) Seine from the neighbourhood of Stockholm. (178, 179) Seines. (180) Model of a Seine. (181) Model of Salmon Seine from the Baltic Coast of Skåne. (182) Eel Trap, combined with Hoop and Bow-Net, from Misterhult in Småland. (183) Model of Eel Trap from Skåne. (184-188) Cod Lines from Bohuslän. (189) Cod Hook. (190) Long Line for catching Ray, from Gullholmen, Bohuslän. (191, 192) Long Lines from Gullholmen, Bohuslän. (193) Thick Long Line for catching Ling, from Gullholmen, Bohuslän. (194) Long Line from Bohuslän. (195) Long Line used at winter-fisheries ("Borrebacka") from Gullholmen, Bohuslän. (196) Long Line used at summer-fisheries for Ling, on the Ocean-bank, "Storeggen," off the Norway Coast, from Bovallstrand, Bohuslän. (197) Long Haddock-Line, from Lysekil, Bohuslän. (198) Long Line for Haddock-fishing on the Ocean Banks in the North Sea, from Gullholmen, Bohuslän. (199) Long Haddock Line. (200) Long Line. (201) Long Cod Line. (202-206) Long Lines. (207) Long Line for Salmon-fishing in the Baltic, from Simrishamn, Skåne. (208) Model of Bottom Net Trap ("Bottengarn") from Skåne. (209) Model of Trap (of netting) for taking Seals ("Stagnät"), from Färö, Gotland. (210) Model of Trap ("Katsa") made of wooden splints, used in the neighbourhood of Stockholm. (211) Fish Spear. (212-218) Buoys from Bohuslän. (219) Water Telescope, from Bohuslän. (220, 221) Rollers attached to the gunwale

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oats, for paying-in lines, from Bohuslän. (**222, 223**) Grapnels, from Bohuslän. (**224**) d Line for Codfishing, and Drag Line for catching Pike, from the Province of Bleking. 5) Eel Trap ("Ål-ryssja"), from the Province of Bleking. (**226**) Salmon Line, from the rince of Bleking, used in the Baltic. (**227**) Cod Line, from the Province of Bleking. (**228**) ring Net, from the Province of Bleking. (**229**) Flounder Net, from the Province of king. (**230**) Hook Tangle ("Pimpeldon") Hand Line implement with radiantly placed ks on snoods, for snatching the fish without bait. (**231**) Great Trap Net with arms, from Baltic.

5. **SVENSK, J.**, Fisherman, Innantjära, Kilafors, Province of Helsingland. 2) Net.

6. **SVENSSON, B.**, Fisherman, Råå, Raus, Province of Skåne. (**233**) ice Net, new.

7. **SVENSSON, H.**, Fisherman, Arildsläge, Brunnby, Province of Skåne. 4) Herring Standing Net of home-spun linen yarn. (**235**) Cod Line of home-spun linen n.

8. **SVENSSON, N.**, Fisherman, Borstahusen, Landskrona, Skåne. 6) Net and two kegs, new. (**237**) Net and two kegs, used. (**238**) Bottom Net. (**239**) under Net. (**240**) Cod Net. (**241**) Cod Line. (**242**) Whiting Line. (**243**) Cod Hook 'ilk") (**244**) Cod and Eel Line.

9. **SVENSSON, P.**, Fisherman, Borstahusen, Landskrona, Skåne. 5) Flounder Net, new, of cotton.

0. **SWEDISH FISHING TACKLE COMPANY (THE)**, represente l B. Danelius (Svenska Fiskredskaps aktiebolaget genom B. Danelius), Stockholm. (**246**) s, Standing Nets, Herring Nets, Seines, &c.

1. **SÖRENSON, N.**, Fisherman, Limhamn, Malmö, Skåne. (**247**) g Line with 100 Hooks for taking Eel and Cod.

2. **ZOOLOGICAL DEPARTMENT, ROYAL MUSEUM OF TURAL HISTORY** (Naturhistoriska Riksmuseum), Stockholm. Ethnographical cimens. (**248**) Hooks, &c. (**249**) Nets, &c.

3. **ÅSTRÖM, H.**, Fisherman, Kivik, Skåne. (**250**) Various Fishing ir.

4. **ÖRNBERG & ANDERSSON**, Göteborg, owners of the Foglavik ssworks in Vestergötland. (**251**) Glass Floats for Nets and Long Lines.

5. **ÖSTERGREN, N.**, Fisherman, Skillenge, Simrishamn, Skåne. 2) Flounder Net.

DIVISION II.

6. **ANDERSSON GÄCK, J.**, Fisherman, Råå, Raus, Skåne. (**253**) wn Seine. (**254**) Hand Net for catching Prawn. (**255**) Worm Stamp for Lug-Worm. 6) Worm Comb ("Ormkam"). (**257**) Whelk Basket ("Kongakupa").

7. **BERGSTRÖM, A.**, Fisherman, Limhamn, Malmö, Bohuslän. **258**) 8) Prawn Net.

8. **CHRISTIANSSON, C. J.**, Merchant, Olofsholm, Malmön, Bohuslän. 9) Lobster Pot.

8*a*. **DICKSON, O.**, Gothenburg. (**259*a***) Lobster Basket.

9. **GUSTAFSSON, O.**, Fisherman, By, Morshyttan, Dalarne. (**260**) ster Pot of Brass-Wire.

0. **KRISTENSON, A.**, Fisherman, Limhamn, Malmö, Skåne. (**261**) wn Net, of a construction new at this Fishing Place.

1. **ROYAL SWEDISH AGRICULTURAL ACADEMY**, Kongl. dtbruksakademien, Stockholm. (**262**) Lobster Pot, from Bohuslän. (**263-265**) Oyster dges from Bohuslän. (**266, 267**) Oyster Tongs from Bohuslän.

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Kongl. Hushållnings Sällskaps Förvaltningsutskott, Umeå). (275)
(276) Model of a Boat for Seal Hunting in the Baltic, with various

57 **HANSSON, L.**, Boat Builder, Limhamn, Mal
Model of Boat for Herring Fishing.

58. **HÅKANSSON, J.**, Fisherman, Kåseberga, Svens
Model of Fishing Boat.

59. **IGGLUND, L.**, Fisherman, Hudiksvall, Helsing
of Standing-Net Boat ("Skötbåt").

60. **KLÄTH, E.**, Ship's Master, Strömstad, Bohuslä
the Drift Fishing Boat "Fredrik."

61. **MÅNSSON, S.**, Fisherman, Kivik, Skåne. (281

62. **MÅRTENSSON, O.**, Fisherman, Kåseberga Sve
Malmöhus, Skåne. (282) Boat used in catching Eel.

63. **NORDENSKIÖLD, A. E.**, Baron, Professor, Roy
of Sciences, Stockholm. (283, 284) Two Oars not painted "Chuk
"Eskimo." (289) Boat Hook, the shaft of wood, the hook of carved
Boat Hook, resembling No. 289, but less carved "Eskimo."

64. **OLSSON, BOSE, N.**, Råå, Raus, Gov. Distr.
(291) Three Models of Boats for Drift-Net fishing and one Model of

65. **POUSARD, P. E.**, Keeper of the Lighthous
Hudiksvall, Helsingland. (292) Model of a Boat with Gear.

66. **ROYAL SWEDISH AGRICULTURAL A**
Landtbruksakademien, Stockholm. (293) Model of Herring Boat f
Gulf of Bothnia. (294) Model of Boat from Gotland. (295) Mod
(296) Model of Boat from Bleking. (297) Model of Boat from B
Herring Boat from the Province of Bleking. (299) Model of Her
Skåne. (300) Model of Mackerel Boat ("Dörjebåt") from Bohuslän
Boat for the Ocean Fisheries in the North Sea, from Bohuslän. (30
Punt, Dory ("Knubbeka") from the Coast of Halland. (304) Mo
from Vesterbotten, used in hunting the Seal or sailing among the Ice.

DIVISION V.

67. **EXECUTIVE COMMITTEE (THE) OF TH**

8. **KAMPENHOF COTTON WORKS COMPANY,** Kampenhofs iebolag, Uddevalla, Bohuslän. (**306**) Canvas of Cotton—Various Qualities and Breadths.

9. **PETTERSSON, J.,** Ropemaker, Uddevalla, Bohuslän. (**307**) les and Ropes.

0. **ROYAL SWEDISH AGRICULTURAL ACADEMY,** Kongl. dtbruksakademien, Stockholm. (**308—314**) Different Kinds of Rope. (**315**) Rope made a Hog's Bristle. (**316**) Seine Rope of Birch Bark, from Stensele in Lycksele District, land. (**317, 318**) Ropes made from Pine-Roots, and used as Net Lines from Stensele, in ksele District, Lapland. (**319**) Ropes made from Pine-Roots for Seine Lines, from Sten-, in Lycksele District, Lapland. (**320**) Seine Ropes of Pine or Fir-Root, from Stensele in ksele District, Lapland.

DIVISION VI.

0A. **ESKELUND, J. N.,** Station-master, Stånga, Gotland. (**321***a*) em of Signalling at night for Fishing Fleets and Vessels.

1. **LEIDESDORFF FISHING-TACKLE MANUFACTORY** E) (Leidesdorffska Fiskredskaps Fabriken), represented by the owner, E. Leidesdorff, holm. (**322**) Patent Sub-aqueous Fishing Lantern.

2. **LINDBERG, L. F.,** Civil Engineer, Stockholm. (**323**) Self-revolving Flashing Lighthouse Apparatus, with small lens adapted, patented (Fishing-light).

3. **ROYAL HYDROGRAPHICAL OFFICE** (Kongl. Sjökarteverket), holm. (**324**) Charts.

DIVISION VII.

4. **HOLMBERG, H.,** Civil Engineer, Varberg, Halland. (**325**) s of the Fishing Harbours in the South of Sweden,

DIVISION VIII.

5. **BJÖRK, N.,** Sub-inspector of Fisheries, Råå, Raus, Skåne. (**326**) for the Manufacture of Fishing-tackle (Needles, &c.).

5*a*. **CHRISTIANSON, C. J.,** Merchant, Malmön, Province of Bohus. *a*) Tools for the Manufacture of Mackerel Net.

6. **KAMPENHOF COTTON WORKS COMPANY** (Kampenhofs bolag), Uddevalla, Bohuslän. (**327**) Twisted Cotton Yarn, of various sizes and numbers ands, for fishing-tackle (as Seines, Nets, Long Lines, &c.).

7. **ROYAL SWEDISH AGRICULTURAL ACADEMY** (Kongl. tbruksakademien), Stockholm. (**328**) Snood-Spinner ("Nossil cock"). (**329**) Spinning ine ("Nossil cock") from Skåne. (**330**) Various Tools for manufacturing Fishing e and Gear, such as Hook-benders, Knives, Netting Needles, Netting Pins, Hooks.

DIVISION IX.

8. **KLINTIN, J. F.,** Civil Engineer, Stockholm. (**331**) Life-boat, full

DIVISION XIII.

9. **ANDERSSON, S.,** Manager of the Hammarö Fishing Company, near stad, Vermland. (**332**) Salmon Net.

0. **BERGIUS, G.,** Inspector of Fisheries for the Provinces of Gestrik- and Helsingland, Gefle, Gov. Distr. of Gefleborg, Gestrikland. (**333**) Model of a on Building or Trap with Locks and Weir at Gefle in Gestrikland. (**334**) Model of lmon Fishery with Weir at Lottefors in Helsingland. (**335**) Models of the Salmon ery with Locks and Weir at Bergvik in Helsingland. (*a*) Wooden Salmon Trap xkar"). (*b*) Wooden Salmon Trap ("Vrakhus") with Locks. (**336**) Models of the on Fishery in the Ljusne River in Helsingland. (*a*) Wooden Salmon Trap. (*b*) Seine

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Gov. Distr. of Gefleborg, Helsingland. (346) Salmon Net.

86. **POUSETTE, C.,** Elfkarleö, Province of Uplan
Appliances for taking Salmon as used in the River Dalelfven.

87. **ROYAL AGRICULTURAL SOCIETY OF T**
**OF GESTRIKLAND AND HELSINGLAND**

88. **ROYAL SWEDISH AGRICULTURAL A**
Landtbruksakademien), Stockholm. (**348**) Model of Wooden Salm
Vermland. (**349**) Model of Wooden Salmon Trap ("Laxkar") fro
(**350**) Model of Salmon Trap from Forshaga in Vermland. (**35**
Fisheries of Motala Östergötland. (**352**) Model of wooden Sal
from Elfkarleby, River Dalelfven. (**353**) Model of Salmon Tr
Elfkarleby, River Dalelfven. (**354**) Model of Netted Salmon
the mouth of the Ume River. (**355**) Model of Salmon Weir with
mina"), from Baggböle on the Ume River. (**356**) Models of w
Klabböle, River Ume. (**357**) Exhibit showing the method of setti
Salmon at Arnemark on the Pite River. (**358**) Netted Salmon P
Lule River. (**359**) Salmon Pen ("Laxpata"), from the Torne Riv
("Ränngarn") running on head line, for Salmon Fishing, from Lafo
same purpose ("Draggarn"), from the Salmon Fisheries in Halland.
for Salmon Fishing, from the Laga River, Halland. (**363**) Sal
Klarelfven. (**364**) Salmon Net from Northbothnia. (**365**) Part of
(**366**) Part of a Salmon Net from Kalix. (**367**) Part of a very coar
Salmon Fishing from the Torne River. (**368—373**) Trout Nets
Salmon Net from Bleking. (**375**) Model of Salmon Weir ("Laxlänk
of the Röune River, Engelholm, Gov. Distr. of Kristianstad, Skåne.

89. **THORKILDSÉN, C.,** Sub-Inspector of Fisherie
of Vermland. (**376**) Salmon Net used in Lake Venern. (**377**) D
ing used in Lake Venern.

DIVISION XIV.

90. **LEIDESDORFF FISHING TACKLE**
(THE), (Leidesdorffska Fiskredskaps Fabriken), Stockholm. (**378**)
Shears.

DIVISION XV.

90*a*. **DICKSON, O.,** Gothenburg. (**379*a***) Salmon
and net from the river Laga in the Prov. of Halland.

. **LIMBORG, H.,** Director of Fisheries for the Provinces of Södermanland Nericia (Nerike). (385) Otter.

. **ROYAL SWEDISH AGRICULTURAL ACADEMY** (Kongl. tbruksakademien), Stockholm. (386) Otter.

DIVISION XVI.

. **LEIDESDORFF FISHING TACKLE MANUFACTORY** E), (Leidesdorffska Fiskredskaps Fabriken), Stockholm. (387) Pike Rods peculiar to en. (388) Perch Rods peculiar to Sweden. (389) Reels. (390) Line Winders. (391) of silk, hemp, and hair, plaited and twisted. (392) Spoon-Baits. (393) Spinning le.

. **LIMBORG, H.,** Director of Fisheries for the Provinces of Söderman- and Nerike. (394) Collection of various Rods and Angling Tackle for winter and ner use.

. **ROYAL SWEDISH AGRICULTURAL ACADEMY** (Kongl. tbruksakademien), Stockholm. (395) Rush Floats with Roll of Line ("Säfbultor"), for &c., from Bleking.

DIVISION XVII.

. **ANDERSSON, N.,** Sub-Inspector of Fisheries, Åhus, Skåne. (396) Net (Tågergarn) for taking Salmon, Pike, &c.

**ANDERSSON, S.,** Manager of the Hammarö Fishing Company, near ad, Vermland. (397) Burbot Net. (398) Net for catching Perch and Gwyniad.

**BERGIUS, G.,** Inspector of Fisheries for the Provinces of Gestrikland elsingland. (399) Gwyniad Seine. (400) Lamprey Basket.

. **BLOMQVIST, H.,** Schoolmaster, Hille, Gefle, Gov. Distr. of Gefle- rov. of Gestrikland. (403) Model of Net for catching Perch. (404) Model of Net for g Roach and River Trout.

. **DUMKY, A.,** Government Fiscal, Tjernäs, Province of Gestrikland. Crayfish Pot.

. **EXECUTIVE COMMITTEE (THE) OF THE ROYAL CULTURAL SOCIETY OF SOUTH WESTROBOTHNIA** (Vesterbottens Kongl. Hushållnings Sällskaps Förvaltningsutskott), Umeå. (406) Lamprey "Stock," oden Cylinder for catching Lampreys.

. **GUSTAFSSON, O.,** Fisherman, By, Morshyttan, Dalarne. Trap ("Ryssja") of Brass Wire. (408) Trap ("Mjärde") of Brass Wire. (409) of Brass Wire for taking Cray-fish. (410) Net Sinkers of Clay.

. **HANSSON, H.,** Vesterberg, Storvik, Gestrikland. (411) Model sh Trap ("Katsa") invented by the Exhibitor.

. **HELLBERG, C.,** Fisherman, Snogeröd, Hurfva, Gov. Distr. of hus, Skåne. (412) Gwyniad Net (40 fathoms).

. **HOLMBERG, P. G.,** Net Maker, Vika kyrkoby, Korsnäs, Dalarne. Long Net. (414) Pike-Perch Net. (415) Bream Net. (416) Bag Net. (417) Nets, Hoop Nets or Weels. (418) Hand Net for catching Bait. (419) Seine. (420) pes of Horse Hair.

. **HOLMGREN, C. F.,** Fisherman, Gefle, Gestrikland. (421) ad Nets.

. **LARSSON, G. W.,** Sub-Inspector of Fisheries, Gässlösa, Ölme, and. (422) A 48-ft. Net Junket ("Ryssja") used for taking Pike-Perch (Lucioperca) e Wener. (423) Two Nets for taking Gwyniad in Lake Wener. (424) Net for taking Perch in Lake Wener.

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109. **LEIDESDORFF FISHING TACKLE MANUFACT** (THE) (Leidesdorffska Fiskredskaps Fabriken), represented by the owner, E. Leid (425) Landing Nets, complete. (426) Mechanical Eel Spears. (427) Bottom Lines and in boxes. (428) Nets, unfitted and fitted suitable for every variety of Fre Fishing.

110. **LIMBORG, H.,** Director of Fisheries in the Provinces of manland and Nerike. (429) Pike Trap, with funnel-shaped inlet. (430) Pike Tr funnel-shaped inlet. (431) Double Burbot Trap for Winter Fishing. (432) Great armed Hoop Net for Spring Fishing. (433) Burbot Trap (to suspend under the Winter Fishing. (434) Double Trap Net for catching Pike-Perch (Spring Season). Perch Seine, with "Gliding" Net. (436) Perch Seine, with Net fastened to the (437) Pike-Perch, and Gwyniad Net, with sliding Netting. (438) Pike-Per Gwyniad Net, with the Net fixed to the Roping. (439) "Asp" Net with fixed for catching *Aspius rapax*. (440) "Asp" Net with sliding Netting. (441) Standin for catching the Baltic Herring. (442) Trammel for catching Bream. (443) Bow taking Roach. (444) Model of Bow Net for taking Bream. (445) Sweep Net const by the Exhibitor. (446) Sweep Net. (447) Model of Hand Net after Mr. Herzman's completely fitted up. (448) Hand Net for catching Fry for bait. (449) Model of Trap or Pen ("Spjelkatsa") (450) Crayfish Baskets or Pots. (451) Conical Tr Lampreys ("Nejonögontina") (452) Model of Eel Trap ("Ålkista").

111. **LINDBLOM, L.,** Sub-Inspector of Fisheries, Årsunda on "Gofle-Dala" Railway, Gestrikland. (453) Net for catching Bream, Pike, Perch, and Vendace and Bait. (454) Junkets. (455) Hoop Net, of Yarn ("Garnmjärde"). ( Wicker-work Weel ("Videmjärde").

112. **OLSSON, BOSE M.,** Fisherman, Råå, Raus, Gov. Distr. of möhus, Skåne. (457) Nets for Fresh-water fishing.

113. **PERSSON, J.,** Fisherman, Karsholm, Kristianstad, Gov. Distr. Kristianstad, Skåne. (458) Sailing Seine for Fresh-water fishing.

114. **POUSARD, P. E.,** Light-house keeper at Saltvik Point, Hudikv Gov. Distr. of Gefleborg, Helsingland. (459) Land Junkets, models. (460) Vendace model. (461) Vendace Seine, model.

115. **ROYAL AGRICULTURAL SOCIETY OF THE PR VINCES OF GESTRIKLAND AND HELSINGLAND).** Great Weel or T ("Storrysaja") for Fresh-water Fishing. Seine ("Spillernot,") with Splints, used Gestrikland.

116. **ROYAL SWEDISH AGRICULTURAL ACADEMY** (Kon Landtbruksakademien), Stockholm. (462, 463) Gwyniad Nets of Silk, from Lake We (464, 465) Nets for taking "Fat" Gwyniad and Burbot, from Stora Eken on the coa Lake Wener. (466, 467) Gwyniad Nets, from Lake Wener. (468) Nets for taking G Gwyniad, from Lake Wener. (469) Net for taking Great Gwyniad, from Lake We (470) Net for taking Small Gwyniad, from Lake Wetter. (471) Gwyniad Net, from L Wetter. (472, 473) Vendace Nets, from Lake Wetter. (474–477) Gwyniad Nets. ( Vendace Net, from Lake Mälar. (479) Net for Green Gwyniad from Lake Runn in Dal (480) Gwyniad Nets, from Angermania. (481) Net, called "Strö," from Lake We (482) Bream Net. (483) Trammel, "Gringarn," or "Skottnät." (484) Perch (485) Perch Net, from Helsingland. (486) Perch and Gwyniad Net, from Stensele, in Lycksele district of Lapland. (487–489) Hoop or Bow Nets of Yarn ("Garnmjärdar") the Freshwater Fisheries. (490) Hoop Net for Burbot ("Lakeryssja"), from Lake Ma (491) Lamprey-Weel, from Norrbotten. (492) Lamprey-Weel, from Elfkarleby. ( Lamprey-Weel or Cone, from the Ume River. (494) Two Weels with small Me (495) Three Eel and three Pike-Leisters, from the Province of Bleking. (496) Weel, from the Province of Bleking. (497) Roach Weel, from the Province of Bl (498) Pike Seine, from the Province of Bleking. (499) Long Line for Eel and Perch, the Province of Bleking. (500) Wicker Basket for Eel, from the Province of Bl (501) Apparatus for catching Eel in strong streams or falls without injuring them,

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1 at the end of the bunt of an Eel Trap. (502) Sink Net (Hand Net for deep-sea use.) 3) Stave or Set Net, from the Province of Bleking. (504) Pike Net, from the Province Bleking. 505 Gwyniad Net, from the Province of Bleking. (506) Roach Net, from the vince of Bleking. (507) Blay Net, from the Province of Bleking. (508-512) Cray-Baskets.

17. **THORKILDSÉN, C.**, Sub-Inspector of Fisheries, Karlstad, Verm-l. (513) Pike Net, from Lake Wener. (514) Net for taking Perch and Gwyniad in e Wener. (515) Net Junket ("Garnmjärde").

18. **WALLNER, O.**, Hudiksvall, Helsingland. (316) Burbot Traps.

DIVISION XVIII.

19. **LARSSON, G. W.**, Sub-Inspector of Fisheries, Gässlösa, Ölme, mland. (517) Collection of Hooks for Freshwater Fishing.

20. **LEIDESDORFF (THE) FISHING TACKLE MANUFAC-RY** (Leidesdorffska Fiskredskaps Fabriken), represented by the owner, E. Leidesdorff, kholm. (518) Hooks, singly, and with Snoods.

21. **LIMBORG, H.**, Director of Fisheries in the Provinces of ermanland and Nerike. (519) Angling Hook. (520) Rod and Reel Hook. (521) Long e with case for different Fish. (522) Long Line for Pike, &c.

22. **ROYAL SWEDISH AGRICULTURAL ACADEMY**, Stock-n. (523) Grapnel-shaped implement, called Lakekäx, consisting of 11 Hooks, radiating 1 a Shank, used for catching Burbot in Lake Wetter.

DIVISION XX.

24. **POUSARD, P.**, Keeper of the Lighthouse at Saltvik-point, liksvall, Helsingland. (526) Model of Boat for Freshwater Fishing, with Gear.

25. **ROYAL SWEDISH AGRICULTURAL ACADEMY** (Kongl. dtbruksakademien), Stockholm. (527) Model of a Punt ("Drageka") used at the Salmon ieries in the River Laga, Halland. (528) Model of Fishing Punt from Lake Mälarn. 9, 530) Boats from Lake Wetter. (531) Boat from Hammarö on Lake Wener. (532) from Lake Siljan, Dalarne. (533) Salmon Fishing Boat from the Ume River.

DIVISION XXI.

26. **CHRISTIANSSON, C. J.**, Merchant, Olofsholm, Malmön, Bohuslän. 4) Fisherman's Outfit.

27. **EXECUTIVE COMMITEE (THE) OF ROYAL AGRICUL-RAL SOCIETY OF SOUTH WESTROBOTHNIA** (Vesterbottens Läns Kongl. hållnings Sällskaps Förvaltnings Utskott), Umeå. (535) Outfit of Sealhunter.

28. **HOLMBERG, P. G.**, Net Maker, Vika kyrkoby, Korsnäs, Dalarne. 3) Hammocks.

29. **ISBERG, S.**, Fisherman, Borstahusen, Landskrona, Skåne. (537) erman's Outfit, consisting of Trousers and Jacket with Hood of tarred seal-skin, oil-cloth thwester, and very high waterproof Boots.

30. **NORDENSKIÖLD, A. E.**, Baron, Professor, Royal Swedish demy of Sciences, Stockholm. (538) Chukches angling, in original dresses with original ng gear. Group from the Vega Expedition, arranged by Kornelia Pålman. (539) Seal-Great Coat, Chukches, Pitlekaj. (540) Seal-gut Great Coat, with borders of seal- and -skin. The ornaments of small feather tufts and horney red plates from the beak of *leris cristatella*. Eskimo, Port Lawrence.

31. **OLSSON, BOSE M.**, Fisherman, Råå, Raus, Province of Skåne. 1) Fishing Boots.

32. **PÅLMAN, KORNELIA**, Assistant at the Ethnographical Depart-t of the Royal Swedish Mus. of Natural History, Stockholm. (542) Photographs.

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## Division XXVI.

133. **ADAMSON, G. P.**, Merchant, Otterbäcken, Vestergötland. (543) Fresh Salmon in ice. (544) Smoked Salmon, whole sides. (545) Slightly salted Salmon ("Graflax").

133*a*. **AHLM, G.**, Merchant, Halmstad. Smoked Salmon.

134. **AHNSTRÖM**, Curer, Marstrand, Bohuslän. (546) Bohus Herring.

135. **ANDERSSON, A. & Co.**, Curers, Merchants, Göteborg. (547) Herring and other kinds of Fish.

136. **ANDERSSON**, Fisherman, Mälar (forwarded by Limborg, Fishery Director). (548) Fresh Fish in ice.

137. **ANDERSSON, G.**, Merchant, Fjellbacka, Bohuslän. (549) Swedish Anchovies (pickled sprats). (550) Swedish Sardines (sprats in oil). (551) Bohus Herring.

138. **ANDERSSON, GACK. J.**, Fisherman, Råå, Raus, Skåne. (552) Salted and pressed Cod (Klippfisk). (553) Dried Fish of different kinds (flounders, plaice, &c.).

139. **ANDERSSON, N.**, Sub-Inspector of Fisheries, Åhus, Skåne (554) Preserved Eel.

140. **ANDERSSON, S.**, Manager of the Hammarö Fishing Company, Karlstad, Vermland. (555) Fresh Salmon in Ice.

141. **ARESCHOUG, O.**, Landed Proprietor, Esperöd, Kivik, Skåne. (556) Salted Eel.

142. **BEIJER, H.**, Sub-Inspector of Fisheries, Grafvarne, Bohuslän. (557) Bohus Herring. (558) Pickled Herring. (559) Salted Cod.

143. **BERG**, Fisherman, Mälar, forwarded by Limborg, Fishery-Director. (560) Fresh Fish in Ice.

144. **BERGIUS, G.**, Inspector of Fisheries for the Provinces of Gestrikland and Helsingland. (561) Salted Herrings from the Baltic ("Strömming") caught with drift nets off the coast of Gefle. (562) Herrings from the Baltic ("Strömming"), salted according to the method used in Gotland.

145. **BERGSTRÖM, H. C.**, Merchant, Lysekil, Bohuslän. (563) Finest Swedish "Delicate Anchovies," potted (564) Delicate Herrings, skinned and boned. (565) Swedish Sardines (sprats in oil).

146. **BERGSTRÖM, H. F.**, Member of the Second Chamber of the Swedish Parliament, Luleå, Vesterbotten. (566) Fresh Salmon in ice.

147. **CARLSSON**, Fisherman, Mälarn, (forwarded by Limborg, Fishery Director). (567) Fresh Fish in ice.

148. **CARLSSON, F.**, Merchant and Manufacturer, Lysekil, Bohuslän (568) Swedish Anchovies. (569) Skinned and boned Herrings, tinned. (570) Bohus Herrings. (571) Bohus "Fat" Herrings.

149. **CHRISTIANSSON, C. J.**, Merchant, Olofsholm, Malmön, Bohuslän. (572) Swedish Anchovies (pickled sprats). (573) Mackerel, preserved in ice. (574) Labrodan. (575) Dried or Split Ling ("Spillånga") for preparing "Lutfisk," which is eaten after having been soaked in lye (lut). (576) Salted Bohus Herrings.

150. **CHRISTIANSSON, O.**, Merchant and Saltery Owner, Olofsholm, Malmön, Bohuslän. (577) Salted and dried Ling ("Langekabiljo"). (578) Salted and dried Cod ("Torskabiljo"). (579) Dried Ling ("Spillånga") for soaking in lye. (580) Swedish Anchovy, tinned. (581) Bohus Herrings.

151. **CORNELIUSSON,** — Merchant, Hafstenssund, Bohuslän. (582) Bohus Herrings. (583) Salted Fish of various kinds.

152. **DAHLGREN, A.**, Civil Engineer, Karlstad, Vermland. (684) Preserved Salmon, "Patent Salmon" in hermetically closed tin boxes.

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153. **DANELIUS, B. A.**, Merchant, Stockholm. (585) Salmon in ice.

154. **EDSTRÖM, T. S.**, Curer, Mollösund, Bohuslän. (586) Products from the bank fisheries in the North Sea. (587) Bohus Herrings.

155. **ERICSON, N. O.**, Merchant, Lysekil, Bohuslän. (588) Superior Swedish Anchovies ("Delicate"). (589) Herrings, skinned and boned superior quality. (590) Salted Ling. (591) Salted Cod. (592) Split Ling. (593) Salted Herrings.

156. **EXECUTIVE COMMITTEE (THE) OF THE ROYAL AGRICULTURAL SOCIETY OF SOUTH WESTROBOTHNIA** (Vesterbottens, Läns Kongl, Hushållnings Sällskaps Förvaltnings Utskott, Umeå). (594) Salted Gwyniad. (595) Salted Herrings from the Baltic ("Strömming").

157. **GERMAN FISH CURING WORKS (THE)** (Tyska Rökeriet), Göteborg. (596) Smoked Bohus Herrings. (597) Fresh Fish in ice.

158. **GIÖBEL, A.**, Civil Engineer, Hammar and Bastedalen, Nerike. (598) Fresh Fish in ice.

159. **GJÖTBERG, O.**, Innkeeper, Lysekil, Bohuslän. (599) Swedish Anchovies.

160. **GOTTLANDER, H.**, Curer and Merchant, Klädesholmen, Bohuslän. (600) Split Ling "Spillånga"). (601) Dried Cod. (602) Salted Ling. (603) Salted and dried Cod (Cabliau). (604) Laberdan. (605) Bohus Herrings.

161. **HAGBERG, A.**, Merchant, Grundsund, Bohuslän. (606) Swedish Anchovies. (607) Skinned and boned Herrings. (608) Cod, Salted and dried (Cabliau). (609) Split Ling ("Spillånga"). (610) Bohus Herrings.

162. **HAGBERG, P. A.**, Merchant, Göteborg, Gov. Distr. of Göteborg and Bohus. (611) Dried Ling, salted ("Langkabiljo"). (612) Cod, dried and salted ("Trakkabiljo"). (613) Salted Haddock.

163. **HALLAND SALMON FISHING COMPANY (THE)**, per agency of Th. Simmingskiöld, Göteborg, and P. Svenonius Laholm. (614) Fresh Salmon in ice. (615) Smoked Salmon.

164. **HALLGREN, J. J.**, Merchant, Gullholmen, Göteborg. (616) Swedish Anchovies, with and without bones, in pickle and in oil, tinned. (617) Bohus Herrings.

165. **HASSELGREN, C.**, Merchant, Uddevalla, Bohuslän. Bohus Herrings.

166. **HEDBERG, J. E.**, Ship's Master, Lysekil, Bohuslän. (618) Different kinds of preserved fish.

167. **HELLSTRÖM, E.**, Fisherman, Hudiksvall, Helsingland. (619) Salted Herrings from the Baltic.

168. **HENRICKSSON, A.**, Fisherman, Borstahusen, Landskrona, Skåne. (620) Dried fish of different kinds.

169. **HJORTSBERG, C. W.**, Tenant of the Salmon Fishery at Edsfors in the Lule River, Svartlå, Boden, Norrbottens Län. (621) Sugar-cured Salmon.

170. **HOLMERTZ, N.**, Tenant of the Salmon Fishery (belonging to the Crown) of Motala in Östergötland. (622) Fresh Fish in ice.

171. **HÅKANSSON, A.**, Fisherman and Sub-Inspector of Fisheries, Knäbäck, Maglehem, Skåne. (623) Salted Eels.

172. **IGGLUND, L.**, Fisherman, Hudiksvall, Helsingland. (624) Herring from the Baltic ("Strömming").

173. **JÄPPSSON, L.**, Fisherman, Baskemölle, Simrishamn, Skåne. (625) Dried Sand Eels.

174. **JÖNSSON, N.**, Fisherman, Limhamn, Malmö, Skåne. (626) Salted Herrings from the Sound (Oresund).

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175. **KAHL, G. W.**, Custom House Officer, Råå, Raus, Skåne. (627) Sugar-cured Öresund Herrings.

176. **KJELLBERG, S.**, Merchant, Lysekil, Bohuslän. (628) Swedish Anchovies, in tins. (629) Herrings, skinned and boned, in tins.

177. **KRUSELL, C. A.**, Curer and Merchant, Klädesholmen, Bohuslän. (630) Split Ling ("Spillånga"). (631) Dried Cod. (632) Salted Ling. (633) Cod, salted and dried ("Cabliau" (634) Laberdan. (635) Bohus Herrings.

178. **KÄLLVIKEN CURING AND FISH-OIL FACTORY (THE)** (Källvikens Salteri och Olje Fabrik), Uddevalla, Bohuslän. (636) Bohus Herrings.

179. **LARSEN, O., & SKÄRSTRÖM, J.**, Curers, Strömstad, Bohuslän. (637) Salted Bohus Herrings.

180. **LARSSON, A.**, Fisherman, Råå, Raus, Skåne. (638) Smoked Eels. (639) Salted Cod. (639*a*) Smoked Plaice.

181. **LARSSON,** — Fisherman, Vrena, Södermanland, forwarded by Limborg, Fishery Director. (640) Fresh Fish in ice.

182. **LARSSON, C.**, Fisherman, Kråkvik, Valdemarsvik, Ostergötland. (641) Swedish Anchovies (pickled sprats), potted.

183. **LARSSON, G. W.**, Sub-Inspector of Fisheries, Gässlösa, Ölme, Vermland. (642) Salted "Fat" Gwyniad from Lake Wener.

184. **LEVEAU, J.**, Custom House Coast Guard, Mölle, Skåne. (643) Salted Herrings from Kullen. (644) Pickled Herrings from Kullen.

185. **LIMBORG, H.**, Director of Fisheries of the Gov. Distr. of Sudermania. Södermanland for two Fishermen from Vinön, Lake Hjelmar. (645) Fresh Fish in ice.

186. **LJUSNE IRON WORKS (THE)** (Ljusne Järnverk), Helsingland. (646) Fresh Salmon from Ljusne, in ice. (647) Salted Salmon from Ljusne.

187. **LUNDGREN, P. W.**, Civil Engineer, Stockholm. (648) Herrings from the Baltic ("Strömming") prepared as Sardines. (649) Trout in oil. (650) Marinated Sprats.

188. **LYSELL, A.**, Merchant, Lysekil, Bohuslän. (651) Swedish Anchovies (pickled sprat). (652) Herrings, preserved, with skin and bones removed ("Delicate Herring"). (653) Salted Herrings from Bohus.

189. **MACFIE, A.**, Herring Curing Company, Uddevalla, Bohuslän. (654) Bohus Herrings. (655) Spent. (656) Small Spent. (657) Superfine Herring.

190. **MARSTRAND CURING COMPANY (THE)** (Marstrands Salteri aktiebolag) Bohuslän. (658) Bohus Herrings.

191. **MOLINDER, A., & CO.**, Manufacturers of Preserves, Stockholm. (659) Cray-fish tails, preserved. (660) Swedish Anchovies, skinned and boned.

192. **MOLLÉN, B. & Co.**, Lysekil, Bohuslän. (661) Swedish Anchovies. (662) Skin- and bone-less Herrings.

193. **NILSSON, E.**, Merchant, Grebbestad, Bohuslän. (663) Salted fish from the fisheries on the North Sea banks. (664) Pickled Bohus Herrings.

194. **NILSSON, E.**, Curer, Grafvarne, Bohuslän. (665) Salted Bohus Herrings. (666) Preserved Mackerel and Sprats. (667) Pickled Bohus Herrings.

195. **OLSSON**, Fisherman, Lake Båfven, forwarded by Limborg, Fishery Director. (668) Fresh Fish in Ice.

196. **OLSSON, S.**, Fisherman, Råå, Raus, Skåne. (669) Salted Öresund Herrings.

197. **PETTERSON**, Fisherman, Nynäs, Södermanland, forwarded by Limborg, Fishery Director. (670) Fresh Fish in ice.

198. **REHNMARK, O. A.**, Merchant, Umeå, Vesterbotten. (671) Smoked Eels. (672) Smoked Herrings ("Böckling"). (673) Cured Salmon, smoked. (674) Swedish

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nchovies. (675) Cooked and tinned Salmon. (676) Cooked and tinned Eels. (677) ooked and tinned Pike. (678) Cooked and tinned Gwyniad. (679) Cooked and tinned erch. (680) Cooked and tinned Pike-Perch. (681) Cooked and tinned Bream.

199. **RUTBERG, J.** (late Major), Saltery owner, Töre, Gammalgård, Norbotten). (682) Salmon (heads and backbones removed) salted when cold.

200. **SANDEBERG, H., Lieutenant,** Stockholm. (683) Fish preerved with superoxide of Hydrogen.

201. **SCHELIN,** Fisherman, Hornsund, Södermanland, forwarded by mborg, Fishery Director. (684) Fresh Fish in ice.

202. **SUNDBERG, G. T.,** Merchant, Vice-Consul, Lysekil, Bohuslän. 85) Swedish Anchovies. (686) Herrings, skinned and boned ("Delicate Herring"). 87) Salted Bohus Herrings.

203. **SVENSSON, N.,** Fisherman, Borstahusen, Landskrona, Skåne. 88) Dried Fish (cod, plaice, flounders, &c.). (689) Salted Herrings from the Sound resund). (690) Pickled Herrings.

204. **SYLVANDER, J.,** Merchant, Curer, Strömstad, Bohuslän. (691) lted Bohus Herrings.

205. **THORBURN, W. E.,** Merchant, Uddevalla, Bohuslän. (692) hus Herrings, salted according to the Scotch method.

206. **THORKILDSEN, C.,** Sub-Inspector of Fisheries, Karlstad, Vermsnd. (693) Salted "Fat" Gwyniad, from Lake Wener.

207. **THE UDDEVALLA HERRING CO., LIMITED,** Uddevalla, v. Distr. of Göteborg and Bohus, Bohuslän. (694) Salted Herring.

208. **WALLIN, J.,** Merchant, Lysekil, Bohuslän. (695) Swedish Anovies. (696) "Delicate" Herrings, skin- and bone-less. (697) Bohus Herrings. (698) kled Herrings.

209. **WELLMAN, J.,** Curer, Ystad, Province of Scania. (699) Cured rrings in tin boxes (cured according to the German method).

210. **WESTERGREN, C.,** Vice-Consul, Haparanda, Vesterbotten. (700) sh Salmon in ice.

DIVISION XXVII.

211. **BEIJER, H.,** Sub-inspector of Fisheries, Grafvarne, Bohuslän. 01) Sounds or Swimming-bladders of Fishes ("Fisksunn") from which Isinglass and latine are prepared.

212. **CARLSON, F.,** Merchant and Manufacturer, Lysekil, Bohuslän. 02) Isinglass. (703) Cod and Ling Sounds. Fish Sounds prepared for clarifying coffee.

213. **CHRISTIANSSON, C. J.,** Merchant, Olofsholm, Malmön, Bohuslän. 04) "Kaffeklaring," material for clarifying coffee.

214. **CHRISTIANSSON, O.,** Merchant, Olofsholm, Malmön, Bohuslän. 05) "Kaffeklaring" material for clarifying coffee, cut, in boxes and packets. (706) affeklaring," material for clarifying coffee, uncut, whole.

215. **GJÖTBERG, O.,** Innkeeper, Lysekil, Bohuslän. (707) Caviare of Cod Roe.

216. **GOTTLANDER, H.,** Curer and Merchant, Klädesholmen, Bohuslän. 08) Salted Cod Roe (Sardine bait).

217. **KJELLBERG, S.,** Merchant, Lysekil, Bohuslän. (709) Cod viare, in glass and tin cases.

218. **KRUSELL, C. A.,** Curer, Merchant, Klädesholmen, Bohuslän. (710) ted Cod Roe (Sardine bait).

218*a*. **KULLBERG, G., & CO.,** Göteborg. (710*a*) Cod Roe (preserved Caviar). (710*b*) Vendace Roe (preserved as Caviar).


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219. **NILSSON, E.,** Curer, Grafvarne, Bohuslän. (711) Fresh Cav
220. **REHNMARK, O. R.,** Merchant, Umeå, Vesterbotten. (712)
Caviare, after the Russian method. (713) Gwyniad Roe (preserved as Caviare).
Vendace Roe (preserved as Caviare). (715) Burbot Roe (preserved as Cavaire).
221. **SAHLSTRÖM & Co.** (represented by H. Sandeberg, Lieute
R.E., Stockholm. Fish Extract. Isinglass. Glue. Oil.
222. **WALLIN, J.,** Merchant, Lysekil, Gov. Distr. of Göteborg
Bohus, Bohuslän. (716) Swedish Caviar.

DIVISION XXIX.

223. **ANGLO-SWEDISH COMPANY, (THE) Limited,** 23 Old Cl
London, E.C., and Lysekil, Bohuslän. (717) Fish Guano. (718) Superphosphates fr
Guano. (719) Oils.
224. **"ARCTIC OCEAN" COMPANY, (THE)** Aktiebolaget Is
Göteborg. (720) Seal Oil.
225. **FISH PRODUCTS COMPANY (THE)** (Fisk-Produkt
laget Göteborg. (721) Fish Oil. (722) Guano, &c.
226. **KÄLLVIKEN CURING AND FISH-OIL WORKS** (
(Källvikens Salteri och Oljefabrik) Uddevalla, Bohuslän. (723) Herring Oil. (724)
227. **SAHLSTRÖM & Co.** (represented by H. Sandeberg, Lieut
R.E., Stockholm. Guano. Albumen.
228. **UDDEVALLA HERRING CO., LIMITED,** Uddevalla,
Distr. of Göteborg and Bohus, Bohuslän. (725) Guano. (726) Fish Oil. Fish Gu
dry in glass pots. Do. dry in glass vessels. Fish oil in glass vessels.

DIVISION XXXII.

229. **AXELSSON, G., Miss,** Norrköping, Östergötland. (727) F
of Fish-scales.
230. **HAGBERG, E., Mrs.,** Grundsund, Bohuslän. (728) Ornam
Fancy Articles of Fish-scales.
231. **HEDIN, H., Miss,** Krognäs, Nyköping, Södermanland.
Flowers of Fish scales.
232. **LEMBKE, F., Miss,** Ystad, Skåne. (730) Ornamental
Articles of Fish-scales.
233. **NOMELL, E., Mrs.,** Göteborg. (731) Fancy Articles, m
Lobster, shells, &c.

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234. **ANDERSSON, GÄCK, J.,** Fisherman, Råå, Raus, Skåne.
"Hyttfat" Apparatus for keeping Prawns. (733) Large Well or Cistern for keep
alive.
235. **CÖSTER, F. L.,** Vice-Consul, Manufacturer, Uddevalla, Bo
(734) Machine-made Barrels of different kinds.
236. **LARSSON, C.,** Fisherman, Kråkvik, Valdemarsvik, Österg
(735) Model of Boat with Well.
237. **NILSSON, J.,** Fisherman, Råå, Raus, Skåne. (736) N
Storing Live Fish.
237*a*. **REIJMYRE GLASS WORKS COMPANY,** Simo
Reijmyre. (736*a*) Glass Vessels.
238. **ROYAL SWEDISH AGRICULTURAL ACADEMY** (
Landtbruksakademien), Stockholm. (737) Sailing Boat with Well, from the Coast of
holm. (738) Rowing Boat with Well, from the Coast of Stockholm.


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DIVISION XXXV.

41. **BLOMQVIST, H.,** Schoolmaster, Hille, Gefle, Gestrikland. (744) lel of Hatching Basket for Spring-spawning fish. (745) Model of Hatching Basket for umn-spawning fish.

242. **ERIKSSON, N. F.,** Manager of Mines, Långnäs, Tjernäs, Gestrik i. (746) Plan of a Piscicultural Establishment at Långnäs, for fish spawning in Spring.

243. **LIMBORG, H.,** Director of Fisheries for the Provinces of Söderman d and Nerike. (747) Well for Cray-fish culture.

244. **PETTERSON, P.,** Sub-Inspector of Fisheries, Uddnäs, Korsnäs, larne. (748) Case for transporting spawning fish, for artificial fecundation.

245. **ROYAL AGRICULTURAL SOCIETY OF GESTRIKLAND ND HELSINGLAND.**

246. **ROYAL SWEDISH AGRICULTURAL ACADEMY** (Kongl. ndtbruksakademien) Stockholm. (749) Model of Piscicultural Establishment (for Salmon) Piparböle Vesterbotten. (750) Model of Piscicultural Establishment (for Salmon) at fsmölla in Halland. (751) Model of Lund's Hatching Cauf for fish spawning in Spring.

247. **WÅHLÉN, TH.,** Manager of Årås, Vermlands Säby, Vermland. 2) Model of Piscicultural Establishment at Årås, Vermland.

DIVISION XXXVII.

248. **YHLEN, v. G.,** Inspector of Fisheries, Lysekil, Bohuslän. (753) 3) Plan of a projected Salmon Pass in the Falls of "Trollhättan."

DIVISION XL.

249. **ARVIDSSON, TH.,** Commander R.S.N., Chief Officer of Royal Hydro- hical Office, Stockholm. (754) Hydrographical Instruments.

250. **EKMAN, F. L.,** Professor, Stockholm. (755) Hydrographical In- ments.

251. **FISHERY COMMITTEE OF VERMLAND (VERMLANDS SKERISTYRELSE),** Karlstad, Vermland. (756) Hydrographical Charts of Vermland.

252. **TRYBOM, F.,** Dr. Ph., Assistant of Fisheries, Lund, Skåne. 6*a*) Dredging Samples from Swedish Lakes in different parts of the country.

DIVISION XLII.

253. **KJELLMAN, F. R.,** Dr. Ph., Professor at the University of Upsala, and. (756*b*) A Collection of Marine Algæ from the western coast of Sweden, collected the winter months.

254. **WITTROCK, V. B.,** Prof., Stockholm, and **NORDSTEDT, C. F. O.** Ph., Lund, Skåne. (756*c*) Algæ aquæ dulcis exsiccatæ; Fasciculi 1–10.

DIVISION XLVI.

255. **MALM, A. H.,** Dr. Ph., Göteborg. (756*d*) Collection of Marine lls peculiar to the Bohus Coast (W. Sweden).

256. **NORDENSKIÖLD, A. E.,** Baron, Professor, Stockholm. (756*e*) Iusca of all the kinds collected by the Vega Expedition.

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DIVISION XLVII.

257. **NORDENSKIÖLD, A. E.**, Baron, Professor, Stockholm. (756*f*) Starfish, Sea Urchins, and Holothuriæ, from the Vega Expedition.

DIVISION XLVIII.

258. **DICKSON, OSCAR**, Göteborg. (756*g*) Lower Marine and Freshwater Animals from Sweden.

259. **NORDENSKIÖLD, A. E.**, Baron, Professor, Stockholm. (757) Worms from the Vega Expedition.

260. **ROYAL MUSEUM OF NATURAL HISTORY**, Stockholm. (758) Bryozoa from Kola, collected by F. Trybom during the Expedition of H. Sandeberg, 1877, determined by F. Smitt.

261. **TRYBOM, F.**, Dr. Ph., Assistant of Fisheries, Lund, Skåne. (759) Bait used along the Coasts of Skåne. (Collection of Animal Bait and baited Hooks, showing manner of using them on those Coasts.)

DIVISION XLIX.

262. **ENTOMOLOGICAL DEPARTMENT OF THE ROYAL MUSEUM OF NATURAL HISTORY** (Riksmusei entomologiska afdelning), Stockholm. (760) Collection of Scandinavian Dytiscidæ (Water-beetles).

263. **ROTH, C. D. E.**, Conservator at the Zoological Museum of the University of Lund, Skåne. (761) Commonest Aquatic Insects of South Sweden, injurious to or serving as food for fishes (as larvæ and fully developed). (Collection in spirits.)

264. **WISTRÖM, J. A.**, Collega Scholæ, Hudiksvall, Helsingland. (762) Dytiscidæ (Water-beetles) from Northern Sweden.

DIVISION L.

265. **LILLJEBORG, W.**, Emeritus Professor, University of Upsala. (763) A Series of Swedish Freshwater Crustacea.

266. **NORDENSKIÖLD, A. E.**, Baron, Professor, Stockholm. (764) Crustacea of all kinds collected by the Vega Expedition.

267. **TRYBOM, F.**, Dr. Ph., Assistant of Fisheries, Lund, Skåne. (765) Food for Herring on the coast of Bohus, during the winter 1880—1881. (Collection in spirits.)

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268. **DICKSON, OSCAR**, Göteborg. (766-68) Collections from the Göteborg Museum.

269. **FISHERY COMMITTEE OF VERMLAND (VERMLANDS FISKERISTYRELSE)**, Gov. Distr. of Vermland, Vermland. (769) Collection of Roe Milt, Fry, young and adult of different Kinds of Fish in the Province of Vermland.

270. **LIMBORG, H.**, Director of Fisheries for the Provinces of Södermanland and Nerike. (769*a*) Collection of Spawn.

271. **MALM, A. H.** Dr. Ph., Göteborg. (770) Head of Cod Fish, skeleton prepared by Exhibitor. (771) Stages of Development of Flounders, illustrative of the memoirs of the late Professor A. W. Malm.

272. **NORDENSKIÖLD, A. E.**, Baron, Professor, Stockholm. (772) Arctic Fish of all Kinds, from the Vega Expedition.

273. **WÅHLEN, TH.**, Agriculturist, Årås, Vermlands Säby, Vermland. (773) Fish Roe, different stages of development, preserved in glycerine. (774) Fish from the mouth of the Gullspang river in Vermland, caught in the Autumn 1822.

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GENTLEMEN,—I have sent the Regulation Cloak that I purchased from you some five or six years ago. Will you have the goodness to put a new collar on it, and return to me.

In justice to yourselves I ought to mention that the cloak in question has seen a good deal of rough work, and with the exception of the collar is not very much the worse.—Yours obediently,

(Signed) ROBERT WEDDELL, CAPTAIN, 1st. E., R.V.C.

Messrs. ANDERSON, ABBOTT, and ANDERSON, Queen Victoria Street, London, E.C.

274. **ZOOLOGICAL DEPARTMENT OF ROYAL MUSEUM OF NATURAL HISTORY** (Naturhistoriska Riksmuseum), Stockholm. (775) Scandinavian Fishes. (776) *See* the Swedish Catalogue, page 194.

275. **DICKSON, OSCAR,** Gothenburg. (777) Skeletons of Aquatic Birds.

DIVISION LIII.

276. **NORDENSKIÖLD, A. E.,** Baron, Professor, Stockholm. (778) Aquatic and other Birds from the Vega Expedition.

DIVISION LIV.

277. **DICKSON, OSCAR,** Göteborg. (779, 780) Skeletons, &c., of Whales and Dolphins.

278. **NORDENSKIÖLD, A. E.,** Baron, Professor, Stockholm. (781) *Rhytina Stelleri* from the Vega Expedition. (782) Banded Seal (*Histriophoca fasciata*).

279. **ROYAL MUSEUM OF NATURAL HISTORY (ZOOLOGICAL DEPARTMENT)** Stockholm. (783) The Killer (*Orca gladiator*) ♀, stuffed specimen from the coast of Bohuslän Jan. 1878. (784) The Pike Whale (*Balænoptera rostrata*) ♀, model, the original specimen from the coast of Bohuslän.

DIVISION LV.

280. **LINDQVIST, J.,** Author, Norrköping, Östergötland. (786) Fishes, their importance in the history of Culture and in National Economy (Fiskarne i Kulturhistorien och Nationalekonomien).

281. **THORKILDSÉN, C.,** Sub-Inspector of Fisheries, Karlstad, Vermland. (786) Map of Fishery District embracing W. Part of the Province of Vermland.

282. **YHLEN, G. v.,** Inspector of Fisheries, Lysekil, Bohuslän. (787) Chart of Herring Fisheries, 1877—1883. (788) Chart of the Trawling Grounds of Cattegat. (789) Publications and Maps concerning the Sea Fisheries.

DIVISION LVIII.

283. **FISHERY COMMITTEE OF THE PROVINCE OF VERMLAND** (Vermlands Fiskeritsyrelse). (791) Complete Summary of the different Fishery Regulations, Codes and Bye-Laws from time to time enacted relative to Fish of all Kinds and their take in the Lakes and Rivers of the Province.

285. **THORKILDSÉN, C.,** Sub-Inspector of Fisheries of Karlstad, Vermland. (792) Fishery Regulations of the Province of Vermland.

DIVISION LX.

286. **BERGIUS, G.,** Inspector of Fisheries for the Provinces of Gestrikland and Helsingland. (793) Drawings showing the different methods of placing the Standing Nets in Norrland. (794) Description of the Fisheries in Norrland.

287. **FISHERY COMMITTEE OF VERMLAND** (Vermlands Fiskeristyrelse). (795) A Summary of the Measures for Preserving and Improving the Fisheries of the Province of Vermland, during the past three years, by the combined grants of the Royal Agricultural Society and Landsting (Assembly of Provincial Delegates.

288. **LINDBLOM, L.,** Sub-Inspector of Fisheries, on the Gefle-Dala Railway Årsunda, Gov. Distr. of Gefleborg, Gestrikland. (796) Drawings and Sketches.

289. **LUNDGREN, W. T.,** Merchant and British Vice-Consul Strömstad, Bohuslän. (797) Harbour Dictionary.

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# SWITZERLAND.

SWITZERLAND, with a surface extent of 41,346·5 square kilomètres, has 32,520 kilomètres of running water (rivers and streams), occupying a space of 231 square kilomètres, the lake expanse amounts to 1342 square kilomètres, so that the total extent of Swiss waters is 1573 square kilomètres.

In these there are found forty-six or forty-eight species of fish, it being questionable, however, whether some of them are distinct species or merely varieties.

The Confederation regulates the whole Fishery Industry through the Federal Council. The administration is assigned to the Forest Section of the Trade and Agricultural Department.

The Federal Law on the Fishery Industry is dated 18th September, 1875, the Council Decree concerning it dates 18th March, 1877.

The execution of the law is left as far as possible in the hands of the different Cantons: some of which are besides charged, by sanction of the Federal Council, with the regulation of the fisheries in boundary waters.

The following Conventions, relating to these last-named fisheries, have been concluded with—

1. Baden and Alsace-Lorraine, dated 14th July, 1877.
2. France, dated 28th December, 1880.
3. Italy, dated 15th September, 1880.

In most of the Cantons the Fishery Industry is under the administration of the Police or Revenue Departments, the police inspection being exercised through the usual channels.

For the boundary-waters on the French frontier the Swiss Convention, has appointed two Fishery Commissioners, and the Cantons of Berne and Neuchatel have appointed a similar official for the inspection of the Doubs.

For the preservation and collection of spawn and young fry during the breeding season the different Cantons appoint fishery agents.

There are at present seven fishery wards in Switzerland, one near the town of Zurich, three in the Canton of Berne (belonging to the Aar, the Emme, and the Romder), one in the territory of the Canton of Zug, and two in the Upper Engadine, Canton Grisons. As the last named are contiguous, there are in reality only six of such wards. For the restoration of free passage to fish in certain streams three fish-ladders have been erected, one in the Saone near Freiburg cut into the sandstone, one in the town of Lucerne, and one in the Looze near Cham; the two last being made of wood.

A report on the subject of water-pollution to the injury of fish, so far as concerns the Basle Industrial District, in the first place, will shortly be prepared and circulated.

In the year 1881–82 there were in Switzerland thirty fish-hatching establishments, and from them issued 3,700,000 fish, principally trout, salmon, salmon-trout, and "röthel." The Confederation awards grants to the amount of 4000 francs to these establishments. A small quantity of foreign fish has up to the present been acquired by these institutions, among them being *Coregonus Maraena B*, *C. albula L*, *C. albus*, *Salmo Guinnat S. fontinalis*, and the land-locked salmon.

The major portion of fishing in Switzerland is a royalty of the cantons, exclusively so in the cantons of Vaud, Vallais, Neuchatel, Oberwalden, Glarus, and Appenzell, also in Rhodon, and, with few exceptions, in the Cantons of St. Gall, Grisons, Solothurn, and Freiburg. Private fishing rights exist principally in the Cantons of Berne, Aargau, and Ticino.

There is a Central Fishermen's Benefit Society, and four local societies (one in the Canton of Basle, two in Grisons, and one in Berne).

The following table shows the total Imports and Exports in the years 1881 and 1882 respectively:—

| | Imports. | | Exports. | |
|---|---|---|---|---|
| | 1881. | 1882. | 1881. | 1882. |
| | Kilos. | Kilos. | Kilos. | Kilos. |
| Fish, prepared, in packages, under 5 kilogrammes . . | 1,424 | 1,391 | 153 | 23 |
| Fresh fish . . . . . | 14,715 | 14,752 | 48 | 120 |
| Fish, dried smoked or salted, in packages of 5 kg. and over:— | | | | |
| Stock-fish . . . . . | 1,449 | 1,286 | 20 | 9 |
| Herrings . . . . . | 746 | 759 | 1 | 9 |
| Other fish. . . . . | 932 | 1,027 | 88 | 71 |
| Total . . . | 19,266 | 19,215 | 310 | 232 |

[*Up to the time of going to press with the Second Edition the List of Exhibits for Switzerland had not been received.*]

ANDERSON, ABBOTT, & ANDERSON'S
FISHING STOCKINGS AND BROGUES
VERY LIGHT.] ALL IN ONE. [VERY STRONG.
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# VENEZUELA.

THE Venezuelan Consul in London furnishes the following information relative to the state of the fishing industry in that Republic:—

There are no restraints upon the fishing industry in Venezuela, the sea frontage being so immense that there is abundance of fish for every one who chooses to secure it, and all are equally free to do so.

In all the larger cities near the coast fish is available every day, and much is of the very finest quality.

No statistics are kept on the subject, the supply being unlimited, and governed only by the demand.

[*Up to the time of going to press with the Second Edition the List of Exhibits for Venezuela had not been received.*]

JOHN GLEN,

ADVERTISEMENT AGENT,

13a, Salisbury Square, Fleet Street,

LONDON, E.C.

*Agent to the Contractors (WILLIAM CLOWES & SONS, Limited) for the Official Publications of the Great International Fisheries Exhibition, 1883.*

# ZANZIBAR.

The territory of Zanzibar extends along the East Coast of Africa from Ivarsheikh, lat. 2° N. to Cape Delgado, lat. 10·45° S. It includes several islands, among which Zanzibar and Pemba are the largest and most thickly populated. In the former is situated Zanzibar, the capital and the residence of the Sultan, H.H. Sayyid Burghash. The dominions of Zanzibar reach a considerable distance into the interior, but trade in fish is confined at present to the coast and islands. North of latitude 2° S., however, there is neither fish industry nor trade, the inhabitants being either Wagunia, or belonging to Somali tribes never touching fish. Whether the whole Somali race share this objection to fish-eating I am unable to say positively, but the Wagunia and South Somalis in these dominions entirely refuse this food. I have often endeavoured to learn the origin and meaning of this peculiarity, which is undoubtedly of old standing, but have never obtained any satisfactory reply. The Somalis have a legend connecting it with their religion (Mohammedan), but as it rests on the miraculous it cannot be accepted. It is, however, commonly believed by them that leprosy is caused by fish-eating. The Wagunia have the deepest loathing for fish, but I could never get any definite reason for their disgust at this diet further than that they considered fish the same as snakes. When travelling with them they have invariably retired altogether apart immediately any of the party commenced to cook or eat fish.

The whole of the fish caught in Zanzibar waters is retailed for home consumption; tortoise-shell and a few pearls to the value of about £3000 annually, and a few consignments of shells are the only products in connection with fish industry that are exported. There are, however, numerous beds of pearl oysters along the coast, and vast quantities of coral and sponge, which will doubtless be hereafter utilized. Ambergris is found on the coast, and finds a ready market among the Arabs at £4 to £5 per ounce.

Zanzibar has a large import trade of dry and salt fish, principally shark and scar-fish (nguru). The imports of cured fish through the custom houses average in annual value £30,000, representing about 500 tons, about £25,000 of which comes to the capital. Almost the whole of this fish comes in native vessels from Oman, Sheher, Sur, and other districts of southern Arabia, but of late it has begun to find its way by steamer from Aden. The only impost upon it is 5 per cent. import duty. There is a fish custom house at Zanzibar, and a regular salt fish market where the fish is sold wholesale, fetching on an average 12s. per cwt. It is afterwards retailed to the working population at about 2d. per lb. Dried fish is the staple animal food of the poor and labouring population both free and slave; it is either grilled or cooked with a little roughly prepared curry, and served as a relish with the evening meal of rice or more commonly meal porridge, in every hut and cottage, two or three ounces sufficing for each person. Any other description of animal food is rarely within the means of natives of the labouring classes, except in the case of those residing on the coast, who at times can procure fresh fish at equally low prices, as well as a great variety of shellfish during the spring tides.

There is a considerable quantity of shark and small fish cured in the coast villages, principally for home consumption, but there are no dues levied upon it, and it is difficult to estimate the amount. The octopus is also dried in large quantities by the native fishermen, and, being sold at a very low price, is largely eaten by the natives. Its use is liable to cause a very unsightly skin disease.

With regard to the proportion of the population engaged in fishing and fish industry it would at such short notice, be only guess-work to attempt to give statistics.

The waters of Zanzibar swarm with fish, but there can be no doubt that the slave trade on this coast has hitherto had great effect in retarding the development of fishing as well as all other industries. The excitement and profit of that nefarious traffic have proved a greater

attraction to those adopting a sea-faring life than the equally precarious and more prosaic occupations of the coast fisherman. This fully accounts for the large import trade the details of which have been given, for though the climate of the Arabian coast is undoubtedly more favourable for the curing of fish, yet there are here fully seven months in the year during which the weather is quite dry and settled enough for drying fish for consumption in the country and there is no dearth of shark and scar-fish for the purpose.

Now, however, that the efforts of Sir John Kirk, and the stringent action he has induced the Sultan to take against the slave trade in these waters have dealt so formidable a blow to the traffic, the large body of seafaring men who have so long been engaged in that semi-piratical occupation are beginning to settle down in these dominions, and it is not unlikely that as this body increases they may successfully compete with the present large import trade from Arabia and thus cheapen the staple animal food of the country.

To those who remember the scarcity of fresh fish here ten or twelve years ago, and can compare it with the regular supply which is now found daily in a commodious fresh fish market, the comparison is very suggestive; in fact, the fish trade, like every other legitimate industry, has made progress in very near ratio to the decline of the slave trade, which, since the Treaty of 1873, and more especially since the loyal co-operation of H.H. Sayyid Burghash in our anti-slavery policy, has received a check from which it will never recover, and which it may be hoped will end ere long in its total suppression.

In Zanzibar itself the class of professional fishermen is large, and along the coast there are in every town and village those who pursue that calling. There are also a great number of natives usually employed in cultivation who engage in fishing during slack seasons.

Fish here are usually caught with a hook and line of native manufacture, the fibre of the pineapple leaf, and of a species of aloe and native cotton, being used in constructing their lines, and the bark of a tree called "M'pesi" employed to tan and strengthen them. Shell fish and squid are the usual baits. The canoes usually lie in seven fathoms and upwards, the fishermen being well acquainted with the resorts of the various species of fish.

Along the coast, wherever the beach is sandy the seine is used, and large quantities of fish are thus obtained when the tide serves.

Fish are also taken in calm weather by using a poison called "Utupa," which is prepared by bruising the leaves of a shrub of that name. When thrown into one or two fathoms it instantly stupefies every fish in the locality, and causes them to come to the surface.

The variety of fish found in Zanzibar waters is very great, but it would be useless to give the native names, and not having a book of reference, it is impossible to identify them either with their popular or scientific designations in Europe. Many are poisonous, and some, though commonly eaten, are known to be liable to induce sickness and rashes. The most marketable kinds are the scar (nguru of the larger fish, and among the smaller the "Changu-chole" (resembling the sole in flavour), the "Kibua" (a kind of mackerel), the "Koana" (red mullet) and the sole, which latter, however, is rare, owing to the difficulty of securing it with native nets. "Dagaa," a name applied to fry and small fish, generally a little larger than whitebait, are also plentiful at certain seasons.

The price of fresh fish may be considered high, being fully half as much as is paid in London for fish of similar quality.

There are no special laws for the protection either of fish or fishermen in this country.

This brief and imperfect notice of the fish and fish trade of Zanzibar may be concluded with the description of a fish whose use, so far as I am aware, has not been mentioned either by travellers or those who have written specially on fish and their habits.

The "Chazo" (sucker fish) is well known to naturalists, and is constantly found adhering to sharks, whales and other fish, and to old timbers raised from deep water. I had long heard tales of their being employed by the natives for the purpose of catching tortoise and turtle, but professional fishermen are very jealous and exclusive, and there was great difficulty in getting them to speak on the subject to a European.

On receiving the notice of the International Fisheries Exhibition, which only reached me two months since, I went among the fishermen, and succeeded in finding two or three fish, one of which I secured, on condition of my consenting to the owner taking it for one more trip, on which he was then starting. The account received from this old fisherman and his companions

tallies so nearly with what was formerly heard regarding this fish that it may be looked upon as substantially accurate.

Young chazo being secured, a ring or loop of iron is let into the tails; they are then kept in a small canoe the water in which is changed from time to time. They are fed sparingly with pieces of meat and fish and, if they survive the confinement, soon become used to captivity and to being handled. When they have reached two or three pounds in weight, they are strong enough for use and are taken out for trial. A line is fastened to the iron loop which has become embedded in a firm growth, and on sighting a tortoise or turtle, the chazo is put overboard. It has to be prevented from affixing itself to the canoe, and then it soon makes for the nearest floating object, to which it instantly adheres, and generally allows itself to be drawn with its prey towards the boat. Should it prove too timid to stand this treatment it is discarded as worthless, but if it will hold on, it soon gets bold enough to retain its hold until taken into the boat, when it is at once detached from the prize by being drawn off sideways, and being returned to its tank is at once fed. They are said soon to learn what is required of them, and it is reported that they have been trained to catch sharks. When in Madagascar some years ago, I was told that the "Tarundu," which the fish is there called, had been trained to catch crocodiles, numbers of which infested the rivers and, as I observed, came down to the neighbourhood of the fishing villages on the coast, without being affected by the salt water.

I hope to forward a specimen of this interesting fish before the close of the Exhibition.* I am not aware how far beyond the tropics it can exist, but it is not impossible that it may be utilized even in European waters.

FRANCIS HOLMWOOD.

*Zanzibar, May 29th*, 1883.

* Up to the time of going to press with the Second Edition this exhibit had not arrived.

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